THE GENUS *NECTRIA* (HYPOCREACEAE) IN PANAMA

By

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SUMMARY

Thirty-two species of *Nectria*, *Calonectria* and *Thyronectria* collected in Panama were studied and are described from specimens deposited in the collections of The New York Botanical Garden. A synoptic key to the species is presented and *Sphaerostilbe mammiformis* Chardón is transferred to *Nectria*.

INTRODUCTION

Nectria Fries is one of the most common genera of Ascomycetes found in the neotropics. Many conidial states produced by tropical species of *Nectria* are cosmopolitan plant pathogens. Because there is no comprehensive treatment of the tropical representatives of the genus, identification of tropical collections is extremely difficult.

Through the Panamanian collections made by G. W. Martin in 1935, Martin and Welden in 1952, and Dumont et al. in 1976, The New York Botanical Garden's collections of *Nectria* and related genera are particularly rich, and apparently representative for the neotropics. The senior author has studied all of these collections as well as several hundred additional collections from Venezuela, Colombia, Ecuador, Peru and Brazil. The purpose here is to report our preliminary findings from Panama material, to provide a synoptic key to the most common species encountered, and to present descriptions of these species to facilitate identification of additional neotropical collections.

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This paper does not attempt to solve several basic taxonomic problems such as the generic separation between *Calonectria* and *Nectria,* nor the circumscription of species within *Calonectria.* This work is currently underway by A. Rossman at Cornell University. Rather, it is a preliminary account of several species from a selected and comparatively well sampled geographic region, whose material is representative of other neotropical regions. These species could then be expected to be found throughout the neotropics. However, we have found additional species in the Andes of Venezuela, Colombia, Ecuador and Peru which are very distinct from those included here, and these will be discussed in a forthcoming paper which will include all of the neotropics. From out other studies we have concluded that there are additional species not yet collected in Panama which would logically be found there, such as *Nectria jungneri* Hennings, *N. mammoidea* Phillips & Plowright, *N. flammea* (Tulasne) Dingley, *Sphaerostilbe ochracea* Patouillard, and *S. wrightii* Berkeley & Curtis.

The following synoptic key is designed after Korf's modified version of Leenhouts (1966). For the mechanics of operation see Korf (1972). In the descriptive section, the species are arranged with those most closely related phylogenetically being placed together. Thus, we are not following the traditional system of the separation of genera based on ascospore septation, but are relying on other morphological features to demostrate relationships.

KEY TO SPECIES

1. Characters of the ascocarp.

   1-1 Ascocarpal color.

   a. white to orange when dry, not becoming red in 3% KOH 15-19, 21-31.

   b. some shade of red when dry or becoming red in 3% KOH 1-14, 20, 32

   1-2 Ascocarpal collapse.

   a. not collapsing 5, 6, 8-12, 14, 15, 18, 19, 27.

   b. collapsing by lateral pinching 1-4, 6-10, 13-20, 28, 29.

   c. becoming cupulate 16, 17, 21-26, 30-32.

   1-3 Ascocarpal height.

   a. less than 400 μm 1-8, 13, 15-18, 20, 22, 24-32.

   b. greater than 400 μm 8-14, 19, 21, 23, 32.

1-4 Ascocarpal apex.

a. rounded or flat, non-papillate 6-8, 10, 12-27, 29-32.

b. acute, definitely papillate 1-4, 9-11, 13-15, 20, 28.

c. flat, discoidal or with a fringe of outwardly growing obovate cells 5.

1-5 Ascocarpal wall.

a. smooth 1-5, 10-12, 16, 17, 30-33.

b. scaly to warted 4, 6-8, 13-21, 32.

c. with hairs 2, 9, 10, 22-27, 29.

d. covered by hyphae or hyphal-like stroma enveloping perithecia 23-25, 28.

1-6 Ascocarpal hairs.

a. singly standing hyphae or chains of more or less swollen cells 2, 9, 10, 29.

b. triangular and fasciculate 22, 26, 27.

1-7 Ascocarpal wall surface.

a. cells lacking a definite shape or textura epidermoidea 1-5, 23-29, 31.

b. cells circular in outline 4-8, 13-15, 19, 22, 23.

c. textura angularis 9-11, 13-18, 20, 21, 30, 32.

d. surface appearing pitted, cells 5 μm or less in diam with walls 2-3 μm thick 12.

1-8 Ascocarpal wall width.

a. 25 μm or less 1-3, 6, 23-26, 28, 29, 31.

b. greater than 30 μm 4, 6-19, 21, 22, 27, 30-32.

1-9 Relationship to other ascocarps.

a. standing singly or loosely aggregated, not enclosed in hyphae 1-8, 12-14, 16, 22, 26, 27, 30.

b. in cespitose groups of from 2-5, not enclosed in hyphae 5, 9-11, 20, 21, 30-32.

c. in cespitose groups of 15 or more, not enclosed in hyphae 13-19.

d. standing singly or in groups of several, enclosed within white hyphae 17-19, 23-25, 28, 29.

2. Characters of asci.

2-1 Length of asci.

a. less than 60 μm 1, 2, 4, 9, 16, 22, 26, 29.

b. 60-90 μm 4, 6, 10, 12, 13, 17-22, 24-28, 30-32.

c. 90-120 μm 3, 5, 7, 8, 11, 14, 15, 20, 21, 32.

d. greater than 130 μm 14, 23.

2-2 Apical apparatus.

a. simple 5-11, 13-15, 18, 20-25, 27, 30-32.

b. with a ring 1, 2-4, 12, 16, 17, 19, 26, 28, 29.

2-3 Arrangement of ascospores.

a. uniseriate in most asci 1-3, 6, 7, 12, 20, 28, 29.

b. four uppermost ascospores biseriate in most asci 1, 2, 4, 9, 13, 14, 16-19, 22, 26.

c. 6-8 ascospores biseriate i- most asci 2, 5, 8, 10, 11, 15, 21, 23-25, 27, 30-32.

3. Characters of ascospores.

3-1 Septation of discharged ascospores.

a. 1 transverse 1-14, 16-30.

b. 1-3 transverse 7, 8, 15, 27.

c. 5-8 transverse 31.

d. with transverse and longitudinal septa 27, 32.

3-2 Color of discharged ascospores.

a. hyaline 2-10, 12-19, 21-32.

b. light brown 1, 3, 11, 13, 14, 20.

3-3 Ornamentation of discharged ascospores.

a. smooth 2-4, 6-8, 11, 12, 14, 15, 21, 23, 29, 31, 32.

b. spinulose or warted 1, 5, 16-18, 28.

c. striate 5, 7, 9, 10, 13-15, 19, 20, 22, 24-27, 30, 31.

3-4 Length of discharged ascospores.

a. less than 10 μm 1, 29.

b. 10-16 μm 2-4, 9, 12, 13, 16-18, 20, 22, 24, 26, 28, 32.

c. 15-22 μm 19, 24, 30, 32.

d. 20-25 μm 5, 6, 14, 15, 25, 32.

e. 25-35 μm 6, 10, 11, 15, 21, 27, 31, 32.

f. greater than 35 μm 7, 8, 23, 31, 32.

3-5 Average width of discharged ascospores.

a. less than 5 μm 1, 2, 4, 9, 12, 13, 16-18, 22, 24-30.

b. greater than 5 μm, but less than 8 μm 3, 7, 10, 19, 20, 23, 27, 31.

c. greater than 8 μm 5, 6, 8, 11, 14, 15, 21, 32.

4. Characters of conidial state.

4-1 Fruiting structures.

a. single conidiophores not united into stromatic structures 1, 4, 5, ? 6, 7, ? 8, 12-16, 19, 22-24, ? 25, 26, 29-31.

b. conidiomata sporodochial 2, ? 6, 9, 17, 18, 20, 21.

c. conidiomata synnematous 3, ? 6, 10, 11, 28, 32.

4-2 Fruiting structures when sporodochial.

a. conidial mass white to salmon to orange, lacking hairs 17-20.

b. conidial mass white; with long, stiff, erect, acute hairs 2.

c. conidial mass green; long white, flexuous hairs may be present 21.

d. conidial mass yellow; straight or hooked, yellow spinulose hairs present 9.

4-3 Fruiting structures when synnematal.

a. synnemata smooth, red 3, 11, 32.

b. synnemata white, with many hyphal ends standing out 28.

c. synnemata white, with yellow spinulose hairs 10.

4-4 Conidial septation.

a. unicellular (no multicellular conidia: see *Fusarium* and *Cylindrocarpon)* 1, 2, 16, 18, 19-24, ? 25, 26-32.

b. 1 - septate 7, 9, 10, 17.

c. 2 or more septate 3-5, 7, ? 8, 11-15.

4-5 Conidial genus.

a. *Acremonium* 1, 22-? 25, 26, 27, 30, 31.

b. *Gliocladium* 16.

c. *Verticillium* 29.

d. *Cylindrocladium* 7, 8.

e. *Cylindrocarpon* 4, 5, 12.

f. *Fusarium* (including *Microcera)* 3, 11, 13-15.

g. *Dendrodochium* 17-? 20.

h. *Volutella* 2.
i. *Kutilakesopsis* 9.
j. *Myrothecium* 21.
k. *Stilbella* 28, 32.
l. *Stromatographium* 10.

5. Substrates.
   a. wood or bark 2-7, 9-22, 28, 30-32.
   b. herbaceous debris, usually well rotted 2, 4, 6-9, 13, 15, 16, 22-28, 30.
   c. usually dicotyledoneous leaves, not well rotted 6.
   d. pyrenomycetes or loculoascyomycetes 1.
   e. myxomycetes 29.

LIST OF SPECIES

1. *Nectria vilior*
2. *N. consors*
3. *N. flavoviridis*
4. *N. radicicola*
5. *N. coronata*
6. *N. venusta*
7. *Calonectria kyotensis*
8. *Nectria gigantospora*
9. *N. flavolanata*
10. *N. mammiformis*
11. *N. jatrophae*
12. *N. discophora*
13. *N. haematococca*
14. *N. illudens*
15. *N. rigidiuscula*
16. *N. ochroleuca*
17. *N. aureofulva*
18. *N. byssicola*
19. *N. subquaternata*
20. *N. olivacea*
21. *N. pityrodes*
22. *N. suffulta*
23. *N. subfalcata*
24. *N. pertusa*
25. *N. foliicola*
26. *N. sylvana*
27. *N. peristomialis*
28. *N. macrostoma*
29. *N. myxomyceticola*
30. *N. arenuloides*
31. *N. calami*
32. *Thyronectria pseudotrichia*

1. **Nectria vilior** Starbäck, Bih. Kongl: Svenska Vetensk.-Akad. Handl. 25, Afd. III, No. **1**: 28. 11 Jan. 1899.

   = *Nectria viridescens* Booth, Mycol. Pap. *73:* 89. 1959.

Conidial state: *Acremonium butryi* (van Beyma) Gams, *Cephalosporium*-artige Schimmelpilze Hyphomycetes, p. 126. 1971.

Perithecia solitary of gregarious, red, pyriform 200-350 x 270-330 μm, with an acute to rounded or flattened apex and a smooth wall, collapsing by lateral pinching when dry, red in 3% KOH, yellow in 100% lactic acid, occurring on the surfaces of ascomycetous stromata. Perithecial wall 20-25 μm thick, not differentiated into layers; cells at the surface irregular in outline with walls ca 2 μm thick. Asci cylindrical, 50-60 x 6-8 μm, apex with an indistinct ring; ascospores uniseriate, becoming biseriate with age. Ascospores ellipsoidal, 7-8 x 3-4 μm, 1 - septate, constricted, verrucose or spinulose, light brown when discharged.

Habitat: on stromata of pyrenomycetes and loculoascomycetes.

Distribution: United States, Great Britain, New Zealand, Panama, Colombia, Venezuela, Peru, Jamaica, Puerto Rico.

COLOMBIA: Depto. Boyacá, El Bosque de Las Mercedes, on Xylariaceae on wood, 29 Jun. 1974, *K. P. Dumont, J. H. Haines, J. M. Idrobo & L. F. Velásquez CO-126* (COL, NY). PANAMA: Prov. Cocle, vicinity of La Mesa, 2.5 Km N of El Valle, en Xylariaceae on wood, 14 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter & S. A. Mori PA-341* (NY).

Illustrations: Booth, Mycol. Pap. 73: 91, fig. 29, 1959 (as *Nectria viridescens);* Gams, *Cephalosporium*-artige Schimmelpilze (Hyphomycetes), p. 127, fig. 84, 1971 (as *Acremonium butryi).*

Notes: This species is identified easily through its small brown, prominently verrucose ascospores and its *Acremonium*-state which is green in culture. Ascospores of northern temperate collections are spinulose, not tuberculate, otherwise temperate and tropical collections are alike.

Nectria cosmariospora Cesati & de Notaris, which is also found in the American tropics, is similar to *N. vilior* in both teleomorphic and anamorphic stages. Ascospores of *N. cosmariospora* measure 13-15 x ca 10 μm and are tuberculate.

2. **Nectria consors** (Ellis & Everhart) Seaver, Mycologia, **1:** 61. 15 Apr. 1909.

= *Dialonectria consors* Ellis & Everhart, J. Mycol. *4:* 122. 1888.

Conidial state: *Volutella minima* von Höhnel, Sitzungsber. Kaiserl. Akad. Wiss., Math. - Naturwiss. Cl., Abt. I, 118: 1543. 1909.

Perithecia superficial on substrate, solitary or in groups of from 2-6, red, pyriform, 210-270 x 150-220 μm with an acute apex and a smooth wall,

collapsing by lateral pinching when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 15-25 μm thick, not differentiated into layers; cells at the surface textura epidermoidea. Hairs arising from the upper half of the wall, scattered, solitary, 10-50 x 5 μm, septate, unbranched. Asci cylindrical, becoming clavate, 40-55 x 5-6 μm, apex with a prominent ring; ascorpores uniseriate. Ascospores fusiform, ellipsoidal to naviculate, 10-11 x 3-4 μm, 1 - septate, not constricted, smooth, hyaline when discharged.

Habitat: on herbaceous debris, less frequently on wood or bark.

Distribution: United States, New Zealand, Java, Panama, Colombia.

COLOMBIA: Depto. Cundinamarca, El Bosque de Tibabita, E Jardines de Paz, on petiole of Oreopanax sp., 28 Jun. 1974, *K. P. Dumont, J. H. Haines, J. M. Idrobo & L. F. Velásquez, CO-151* (COL, NY). PANAMA: Prov. Chiriquí, Casita Alta, above Boquete, 1 Aug. 1952, *G. W. Martin & A. L. Welden 8172* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on twig, 15 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter & S. A. Mori PA-387* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on branch, 15 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter & S. A. Mori PA-405* (NY).

Illustrations: Samuels, Mycologia, 69: 258, figs. 1-6; 259, figs. 7-12. 1977.

Notes: This species is closely related to *Nectria brassicae* Ellis & Saccardo (Booth, 1959) and *N. sanseveriae* (Batista, Bezerra & Almeida) Samuels (Samuels, 1973-b). Samuels (1977) redescribed *N. consors* and its conidial state.

3. **Nectria flavoviridis** (Fuckel) Wollenber, Angew. Bot., **8:** 186. 1926.

= *Sphaerostilbe flavoviridis* Fuckel, Jahrb. Nassauischen Vereins Naturk. *25-26:* 310. 1871.

Conidial state: *Fusarium melanochlorum* (Caspari) Saccardo, Syll. Fung. *4:* 725. 10 Apr. 1886.

Perithecia superficial or partially immersed within the substrate, solitary or in small groups, red pyriform, with a darker red, rounded papilla and a smooth wall, ca 350 x 300 μm, collapsing by lateral pinching when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 20-25 μm, not differentiated into layers; cells at the surface textura epidermoidea with walls 1-2 μm thick. Asci cylindrical, 85-104 x 7-9 μm, apex with a ring; ascospores uniseriate. Ascospores ellipsoidal 10-16 x 5-8 μm, 1 - septate, at most slightly constricted, smooth, hyaline to light brown when discharged.

Habitat: on bark.

Distribution: United States. Great Britain, Germany, Panama, Colombia, Brazil.

COLOMBIA: Depto. Cundinamarca, ca 28 mi from Bogota, on the Bogota-El Colegio road, vía Salto de Tequendama, ca 6.000 ft., on bark, 13 Jan. 1976, *K. P. Dumont, P. Buriticá, J. L. Luteyn & L. A. Molina CO-2548* (COL, NY). PANAMA: Prov. Veraguas, along Panama Highway 35 from Sta. Fe to Calovebora, ca 14 Km from Sta. Fe, ca 1.900 ft., on ? Xylariaceae, 17 Jun. 1975, *K. P. Dumont, S. E. Carpenter & S. A. Mori PA-515* (NY).

Notes: *Nectria flavoviridis* is readily recognized by its yellow stilboid state and by the green coloration produced in culture. Without the conidial state, this species is difficult to identify. *Nectria sanguinea* (Bolton ex Fries) Fries is commonly reported from the tropics and according to Booth (1959), the species concept is confused and may be *N. flavoviridis*.

4. **Nectria radicicola** Gerlach & Nilsson, Phytopathol. Z., **48:** 255. 1963.

Conidial state: *Cylindrocarpon destructans* (Zinssm.) Scholten, Neth. J. Plant Path., *70* (suppl. 2): 2. 1964.

Perithecia solitary or in small groups, superficial, red, pyriform, 120-350 x 150-320 μm, with an acute papilla and a smooth to slightly roughened wall, collapsing by lateral pinching when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 30-40 μm thick, with a prominent outer region of 1-2 layers of circular cells measuring 20-30 μm in diam; cells at the surface circular in outline, 20-30 μm in diam with walls 1-2 μm thick. Asci cylindrical to narrowly clavate, 55-85 x 5-10 μm, apex with a small ring; ascospores uniseriate or biseriate above and uniseriate below. Ascospores ellipsoidal to elliptic-fusiform, 10-13 x 3-4 μm, 1-septate, not constricted, smooth, hyaline when discharged.

Habitat: on wood and herbaceous debris; conidial state frequently isolated from soil.

Distribution: Sweden, Panama, Colombia, Ecuador, Peru.

COLOMBIA: Depto. Cundinamarca, Quebrada Aguas Blancas, road between Sibaté and Fusagasugá, on herbaceous stem, 1 Jul. 1974, *K. P. Dumont, J. H. Haines & J. M. Idrobo CO-336* (COL, NY); Depto. Cundinamarca, páramo de Cruz Verde, road between Bogota and Choachí, on flower stalk of Puya sp., 2 Jul. 1974, *K. P. Dumont, J. H. Haines & J. M. Idrobo CO-512* (COL, NY). ECUADOR: Prov. Pichincha, ca 37 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.600 ft., on fern rachis, 16 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-152*

(NY); Prov. Pichincha, ca 37 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, 7.600 ft., on herbaceous stem, 16 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-161* (NY); Prov. Pichincha, ca 39 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.200 ft., on stem, 17 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-187* (NY). PANAMA: Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe on property of Agricultural School Alto de las Piedras, ca 2.000 ft., on fruit, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-772* (NY); Prov. San Blas, from Puerto Obaldía along trail to Darién and the foothills of the Cordillera, ca 5 hours walk WNW of Puerto Obaldía, ca 600 ft., on wood, 23 Jun. 1975, *K. P. Dumont & S. A. Mori PA-1178* (NY). PERU: Depto. Junín, vicinity Carrizales, ca 130 Km from Huancayo, on the Satipo-Huancayo road, ca 12.000 ft., on flowering stalk of bromeliad, 9 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1097* (NY, USM); Depto. Junín, ca 135 Km from Huancayo on the Satipo-Huancayo road, ca 1.800 ft., en fruit of Balanophoraceae, 9 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1212* (NY, USM).

Illustrations: Gerlach & Nilsson, Phytopathol. Z. 48: 252, figs. 1, 2; 253, figs. 3, 4; 254, figs. 5, 6; 255, fig. 7, 1963; Booth, Mycol. Pap. 104: 36, fig. 20, 1966 (as *Cylindrocarpon destructans)*.

Notes: Gerlach and Nilsson (1936) and Booth (1966) have discussed the pathogenicity and taxonomy of this common species. *Nectria radicicola* is very closely related to two New Zealand species, *N. coprosmae* Dingley and *N. tawa* Dingley.

5. **Nectria coronata** Penzig & Saccardo, Malpighia, **11:** 510. 1897.

Conidial state: *Cylindrocarpon* sp.

Perithecia in groups of several seated aroun a barely erumpent stroma, less frequently solitary, red to vinaceous, often with a darker, fringed ostiolar disc, ovate, 300-450 x 250-350 μm, not collapsing when dry, 200-300 μm in diam, formed by outwardly growing obovate cells, 30-50 μm long, by 17-30 μm wide at the tip, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall smooth 20-30 μm wide, not differentiated into regions; cells at the surface lacking a definite shape. Asci clavate, 90-100 x 20 μm, apex simple; ascospores biseriate. Ascorpores fusiform, 20-27 x 8-10 μm, 1 - septate, not constricted, spinulose to spinulose-striate, hyaline when discharged.

Habitat: on bark and wood, rarely on herbaceous stems.

Distribution: Java, Jamaica, Panama, Colombia, Venezuela, Ecuador, Peru, Dominica.

COLOMBIA: Depto. Cundinamarca, ca 100 Km from Bogota, on the Bogota-Villavicencio road, vía Cáqueza, ca 4.400 ft., on branch, 7 Jan. 1976, *K. P. Dumont, P. Buriticá & J. L. Luteyn CO-2257* (COL, NY). ECUADOR: Prov. Pichincha, ca 37 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.600 ft., on bark, 16 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-147* (NY); Prov. Pichincha, ca 39 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.200 ft., on plant debris, 17 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-205* (NY). JAMAICA: Portland Parish, along trail to Silver Hill Gap, near Woodcutter's Gap, vicinity of Newcastle, 9 Jan. 1971, *R. P. Korf, J. R. Dixon, K. P. Dumont, R. W. Erb, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 955* (NY); Portland Parish, along trail to Silver Hill Gap, near Woodcutter's Gap, vicinity of Newcastle, on wood, 9 Jan. 1971, *R. P. Korf, J. R. Dixon, K. P. Dumont, R. W. Erb, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 759* (CUP, IJ, NY); St. Thomas Parish, trail between Barretts Gap and Corn Puss Gap, ca 1.600-2.000 ft., on wood, 14 Jan. 1971, *R. P. Korf, J. R. Dixon, K. P. Dumont, R. W. Erb, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 866* (NY). PANAMA: Prov. Chiriquí, Casita Alta, above Boquete, 1 Aug. 1952, *G. W. Martin & A. L. Welden 8173* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle on road to Mata Ahogada, ca 2.000 ft., on leaf, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-429* (NY). PERU: Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo road, at a point ca 135 Km from the intersection on the Cuzco-Puno road, on branch, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1784* (NY, USM). VENEZUELA: Edo. Sucre, ca ½ hour walk along trail N of Manacal, NW of Irapa, on bark, 9 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & J. Farfán VE-4487* (NY, VEN).

Illustrations: Holnel, Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 118: 300, fig. 7, 1909; Penzig and Saccardo, Icones Fungorum Javanicorum, pl. 28, fig. 4, 1904.

Notes: Isolates derived from solitary ascospores from Jamaican and Venezuelan specimens produced a white to cream colored colony on potato dextrose agar medium; only macronidia were produced. The macroconidia are straight or slightly curved, 3-5 septate, 40-80 x 7-8 μm. Perithecia form in some, but not all, isolates derived from solitary ascospores.

6. **Nectria venusta** H. Sydow, Ann. Mycol., **28:** 119. 20 May 1930.

Conidial state: unknown.

Perithecia standing singly, erumpent through the leaf epidermis, amphigenous, red, egg-shaped, 300-330 x 240-260 μm, with an acute apex and a warted wall, collapsing by lateral pinching when dry, red in 3% KOH, yellow en 100% lactic acid. Perithecial wall 15-20 μm wide, not differentiated into regions; cells at the surface circular in outline, 15-20 μm in diam; wall 1 μm thick, built up to form conical warts. Asci clavate, 60-80 x 12-15 μm, apex simple; ascospores uniseriate. Ascospores fusiform, allantoid to nearly dumbbell shaped, 23-38 x 8-10 μm, 1 - septate, constricted, smooth, hyaline when discharged.

Habitat: recently dead coriaceous leaves of dicotyledonous plants, less frequently on other herbaceous debris.

Distribution: Panama, Colombia, Venezuela.

COLOMBIA: Depto. Cundinamarca, ca 28 mi from Bogota, on the Bogota-El Colegio road, vía Salto de Tequendama, ca 6.000 ft., on monocot stem, 13 Jan. 1976, *K. P. Dumont, P. Buriticá, J. L. Luteyn & L. A. Molina CO-2565* (COL, NY). PANAMA: Canal Zone, Barro Colorado Island, 16 Jun. 1952, *G. W. Martin & A. L. Welden 7756* (NY); Canal Zone, Barro Colorado Island, 16 Jul. 1952, *G. W. Martin & A. L. Welden 7771* (NY); Canal Zone, Corundu, 12 Aug. 1952, *G. W. Martin & A. L. Welden 8734* (NY). VENEZUELA: El Limón, pr. Puerto La Cruz, in foliis emortuis Fici radulae, 18 Jan. 1928, *H. Sydow* [Sydow, Fungi exsiccati No. 837 (NY), isotype *Nectria venusta*].

Notes: This species is recognized easily through its red, egg-shaped, slightly warted perithecia that are difficult to remove from the leaf surface and through its large, bicellular ascospores.

7. **Calonectria kyotensis** Terashita, Trans. Mycol. Soc. Japan, **8:** 124. 1 Jan. 1968.

   Conidial state: *Cylindrocladium floridanum* Sobers & Seymour, Phytopathology, *57:* 392. 1967.

Perithecia standing singly, erumpent through the leaf epidermis, amphigenous, red-orange, egg-shaped, 240-290 x 170-240 μm, with an acute apex and a warted wall, not collapsing when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 30-40 μm wide, not differentiated into regions; cells at the surface circular in outline, 15-30 μm in diam, wall 1 μm thick, built up to form conical warts. Asci clavate, 80-140 x 10-18 μm, apex simple; ascospores biseriate. Ascospores fusiform of elongate-reniform, 30-40 x 6-7 μm, 1 (-3) septate, not constricted, smooth of faintly striate, hyaline when discharged.

Habitad: on recently dead leaves of dicotyledonous plants.

Distribution: United States, England, Germany, Japan, Mauritius, Panama.

PANAMA: Canal Zone, Ft. Sherman Area, 6 Aug. 1945, *G. W. Martin 6168* (NY); Barro Colorado Island, along Drayton trail, 9 Jul. 1973, *R. D. Goos, BCI 70* (NY).

Illustrations: Peerally, C. M. I. Descript. Pathog. Fungi Bact. 421, 1974; Terashita, Trans. Mycol. Soc. Japan 8: 125, figs. 1, 2; 127, pl. 1, 1968.

Notes: *Calonectria kyotensis* is cited as the cause of seedling diseases in a wide variety of trees. Peerally (1974) and Sobers (1972) summarize information on the pathogenicity and taxonomy of the species. The Cylindrocladium state is present in *Martin 6168.*

8. **Nectria gigantospora** Zimmerman, Bull. Inst. Bot. Buitenzorg, **10:** 15. 1901.

= *Nectria indusiate* Seaver, Mycologia, *20:* 58. 1 Mar. 1928.

Conidial state: *Cylindrocladium* sp.

Perithecia standing singly, erumpent through the leaf surface, amphigenous, orange to red, egg-shaped, 350-550 x 300-500 μm, with an acute apex and a warted wall, collapsing by lateral pinching or not collapsing when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 20-50 μm wide, not differentiated into regions; cells at the surface circular in outline, 20-30 μm in diam, wall 1-2 μm thick, built up to form conical warts. Asci fusiform, 90-100 x 20-25 μm, apex simple; ascospores biseriate. Ascospores fusiform or elongate-reniform, 50-65 x 7-10 μm, 1- or 3-septate, not constricted, smooth, hyaline when discharged.

Habitat: on leaves of *Microphalis* sp., *Didymopanax* sp., and others.

Distribution: Trinidad, Panama, Ecuador, Java.

ECUADOR: Prov. Pichincha, ca 37 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.600 ft., on bark, 16 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-147* (NY). PANAMA: Canal Zone, Ft. Sherman Area, on fallen leaves of *Didymopanaz maratotoni,* 12 Aug., 1945, *G. W. Martin 6186* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on leaf, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-386* (NY); Prov. Panama, 10-12 Km N of Pan American Highway on El Llano-Cartí road, ca 1.000-1.300 ft., on fruit, 28 Jan. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1269* (NY). TRINIDAD: Morne

Bleu, on dead leaf of *Micropolis* sp., 13 Mar. 1921, *F. J. Seaver* [Plants of Trinidad No. *3176* (NY), *holotype Nectria indusiata*].

Illustrations: Seaver, Mycologia 20: pl. 10, figs. 1-3, 1928 (as *Calonectria indusiata*).

Notes: According to Booth (1966), perithecia of *Nectria gigantospora* are morphologically similar to those species known to have Cylindrocladium conidial states, such as to *Calonectria retaudii* (Bugn.) Booth, which may be synonymous with *N. gigantospora*. The species of *Nectria* and *Calonectria* having *Cylindrocladium* states are in need of taxonomic revision. Many of these species are known as root pathogens.

9. **Nectria flavolanata** Berkeley & Broome, J. Linn. Soc., Bot., **14:** 114. 3 Dec. 1873.

= *Nectria bicolor* Ellis & Everhart, Proc. Acad. Nat. Sci. Philadelphia, *1893:* 443. 27 Feb. 1894 (non Berkeley & Broome).

= *Nectria flavociliata* Seaver, Mycologia, *1:* 54. 1909.

= *Nectria tjibodensis* Penzig & Saccardo, Malpighia, *11:* 512. 1897.

= *Nectriella flocculenta* Hennings & Nyman, Monsunia, *1:* 160. 1899.

= *Nectria vanillae* Zimmerman, Centralbl. II. Bakteriol. Parasitenk., 2. Abht., *8:* 470. 1902.

Conidial state: *Kutilakesopsis macalpineae* Agnihothrudu & Barva, J. Indian Bot. Soc., *36:* 309. 1957.

Perithecia cespitose in groups of 2-10, seated upon an erumpent, tubercular stroma, forming after conidial production, red, broadly pyriform, 400 x 350 μm, with an acute apex and a smooth wall, collapsing by lateral pinching or not collapsing when dry, red in 3% KOH, yellow in 100% lactic acid, with yellow narrowly clavate, spinulose hairs arising from stroma and from perithecial walls. Perithecial wall ca 35 μm thick, not differentiated into regions; cells at the surface textura angularis, 7-10 μm in greatest dimension, walls 1 μm thick. Asci narrowly clavate, 50-60 x 7-9 μm, apex simple, ascospores biseriate above, uniseriate below. Ascospores fusiform, 13-18 x 4-5 μm, 1 - septate, constricted or not, prominently striate, hyaline when discharged.

Habitat: on wood and decaying herbaceous debris.

Distribution: United States, New Zealand, Cook Islands, Ceylon, India, Trinidad, Costa Rica, Panama, Colombia, Venezuela, Ecuador, Peru.

COLOMBIA: Depto. Cauca, finca "El Bosque", vereda Guasabarita, El Tambo, on twig, 15 Jul. 1974, *K. P. Dumont, J. H. Haines, J. M. Idrobo & L. F. Velásquez CO-1378* (COL, NY). ECUADOR: Prov. Pichincha, ca 39

Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.200 ft., on herbaceous debris, 17 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-180* (NY). INDONESIA: Java, Tjibodas (Corticibus, Penzig, 4.2. 1899) (BO, PAD, W), *isotypes Nectria tjibodensis.* PANAMA: Prov. Chiriquí, Casita Alta, above Boquete, 1 Aug. 1952, *G. W. Martin & A. L. Welden 8172* (NY); Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on twigs, 13 June 1975, *K. P. Dumont, S. M., S. E. Carpenter & S. A. Mori PA-236* (NY). PERU: Depto. Loreto, ca 71 Km from Tingo María, on the Pucallpa-Tingo María road, ca 2.400 ft., on herbaceous stem, 4 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-882* (NY, USM); Depto. Junín, ca 143 Km from Huancayo on the Huancayo-Satipo road, ca 10.000 ft., on herbaceous stem, 9 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1280* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo road, at a point ca 135 Km from the intersection on the Cuzco-Puno road, on twig, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1732* (NY, USM). SRI LANKA: Central Province, on bark, G. H. K. T., 239-b *(holotype N. flavolanata* ex K).

Illustrations: Agnihothrudu & Barva, J. Indian Bot. Soc. 36: 310, figs. 1-12, 1957 (as *Kutilakesopsis macalpineae);* Seaver, Mycologia 20: pl. 11, figs. 5-10, 1928 (as *Nectria rhytidospora);* Wollenweber, Fusaria Autogr. Del. Tab. 746, 747, 1930; Zimmerman, Centralbl. Bakteriol., 2 Abth. 8: 471, fig. 2; 473, figs. 3, 4, 1902 (as *Nectria vanillae).*

Notes: Nag Raj and Govindu (1969) are apparently the first to have noted the connection between *Nectria flavolanata* and *Kutilakesopsis macalpineae.* Isolations of solitary ascospores of several Jamaican and Venezuelan collections confirm this observation.

Wollenweber's (1930) illustrations of *Nectriella flocculenta* and *Nectria vanillae* leave no doubt to the identity of these species and their placement into synonymy with *N. flavolanata.* Seaver (1928) described and illustrated *Nectria rhytidospora* Patouillard. The illustrations are typical of *N. flavolanata* and the specimen in NY with the original sketches (Trinidad: Mora Forest, E of Sangre Grande, *F. J. Seaver,* 10 Apr. 1921) is a mixed collection with both *Nectria flavolanata* and *N. coronata,* or a closely related species.

10. **Nectria mammiformis** (Chardon) Samuels, comb. nov.

= *Sphaerostilbe mammiformis* Chardon in Seaver & Chardon, Sci. Surv. Porto Rico and Virgin Islands, *8:* 46. 29 Dec. 1926.

Conidial state: *Stromatographium mammiformis* Ciferri, Sydowia, *8:* 264. 1 Sept. 1954.

Perithecia often at the base of a white synemmata on a small stroma, solitary or in cespitose groups of 10 or more, red, pyriform 600-700 x 550-660 μm, with an acute papilla and a smooth wall, collapsing by lateral pinching or not collapsing when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 30-40 μm wide, not differentiated into regions; cells at the surface textura angularis, 10-20 μm in greatest dimension, wall ca 2 μm in thick. Hairs arising from the surface of the wall, up to 150 μm long yellow, spinulose, septate, thin walled, tip often slightly swollen. Asci fusiform, 80-90 x 15-25 μm, apex simple; ascospores biseriate. Ascospores fusiform 25-35 x 7-8 μm, with pointed ends, 1 - septate, constricted, coarsely striate, hyaline when discharged.

Habitat: on wood.

Distribution: Jamaica, Panama, Venezuela, Colombia, Ecuador, Peru.

COLOMBIA: Depto. Cundinamarca, ca 28 Km from Mosquera, on the Mosquera-La Mesa road, ca 6.600 ft., on branch, 3 Jan. 1976, *K. P. Dumont, J. L. & M. L. Luteyn CO-2075* (COL, NY); Depto. Cundinamarca, ca 100 Km from Bogota, on the Bogota-Villavicencio road, vía Cáqueza, ca 4.400 ft., on branch 7 Jan. 1976, *K. P. Dumont, P. Buriticá & J. L. Luteyn CO-2265* (COL, NY). ECUADOR: Prov. Pichincha, ca 39 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.200 ft., on bark, 17 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-204* (NY); Prov. Pichincha, ca 39 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.200 ft., on herbaceous stem, 17 Jul. 1975, *K. P. Dumont, S. E., Carpenter & P. Buriticá EC-216* (NY). JAMAICA: Hanover Parish, Dolphin head, vicinity Askenish, ca 1.000 ft., on wood, 22 Jan. 1971, *R. P. Korf, J. R. Dixon, K. P. Dumont, R. W. Erb, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 929* (CUP, IJ, NY); St. Andrew Parish, vicinity of Dick's Pond, west of Hardwar Gap, near Holywell Recreation Area and Wag Water River, ca 2.800-3.000 ft., 11 Jan. 1971, *R. P. Korf, J. R. Dixon, K. P. Dumont, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 807* (NY). PANAMA: Canal Zone, Barro Colorado Island, on bark, 11 Jul. 1952, *G. W. Martin & A. L. Welden 7608* (NY). PERU: Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo road, at a point ca 135 Km from the intersection of the Cuzco-Puno road, on branch, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1690* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 135 Km from the intersection of the Cuzco-Puno Rd, on branch, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1731* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 135 Km from the intersection of the Cuzco-Puno Rd, on branch,

19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1742* (NY, USM).

Notes: Solitary ascospores isolated from several Jamaican collections produced cultures of the synnemata of *Stromatographium mammiformis* and perithecia in pure culture. The synnemata of this species are white, lanose and bear a single, yellow slime mass of conidia at the apex. Yellow, spinulose hairs identical to those arising from the perithecial wall arise from the stalk and disc of the synnemata. The conidia are oblong, 27-30 x 10-12 μm, 1 - septate and hyaline. *Nectria mammiformis* is superficially indistinguishable from *N. flavolanata* and *Sphaerostilbe ochracea* Patouillard. *Sphaerostilbe ochracea* is common in the neotropics and differs from *N. mammiformis* primarily in having ascospores 17-22 x 4-5 μm. The senior author has cultured solitary ascospores of collections of *S. ochracea* made in Jamaica and a *Stromatographium* Hohnel similar to *S. mammiformis* was produced.

11. **Nectria jatrophae** (Möller) Wollenweber, Z. Parasitenk (Berlin), 3: 490. 1931.

= *Corallomyces jatrophae* Möller, Bot. Mitt. Tropen, *9:* 295. 190. 1901.

= *Nectria amazonensis* (Batista, Bezerra & Almeida) Samuels, Can. J. Bot., *51:* 1278. 1973.

= *Macbridella amazonensis* Batista, Bezerra & Almeida, An. XIV Congr. Nac. Soc. Bot. Brasil, *1963:* 118. 1964.

Conidial state: *Fusarium* sp.

Perithecia usually at the base of red synnemata, seated on an erumpent stroma, in cespitose clusters of from 2 to several, pyriform 350-700 x 460-500 μm, red around the ostiolar area, with a white furfuraceous covering over the lower 1/3 of each perithecium that often wears off, with an acute apex and a smooth wall, not collapsing when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 30-40 μm wide, not differentiated into regions; cells at the surface textura angularis, 10-15 μm in greatest dimension, walls ca 2 μm thick. Asci clavate, 90-110 x 13-18 μm, apex simple; ascospores biseriate. Ascospores fusiform to reniform, 29-35 x 9-11 μm, 1 - septate, not constricted, smooth, light brown when discharged.

Habitat: on wood.

Distribution: Costa Rica, Nicaragua, Panama, Colombia, Brazil,

Brazil: Manaus, Plantae ignotae, 15 Aug. 1961, A. C. Batista 22806 (NY, URM *holotype of Macbridella amazonensis).* Costa Rica: Guapiles, near finca "Los Diamantes", 1.200 ft., on bark, 18 Sept. 1964, *G. C. Carrol 661* (NY). Panama: Prov. Panama, Río Tapia, 5 Aug. 1937, *R. E. Woodson*

4634 (NY); Canal Zone, Río Sardinilla, 10 Jul. 1952, *G. W. Martin & A. L. Welden 7510* (NY); Canal Zone, Río Sardinilla, 10 Jul. 1952, *G. W. Martin & A. L. Welden 7550* (NY).

Illustrations: Möller, Bot. Mitt. Tropen, 9: pl. 1, figs. 21-28, 30; pl. 2, figs. 31, 32; pl. 9, fig. 5, 1901 (as *Corallomyces jatrophae);* Samuels, Canad. J. Bot. 51: 1279, figs. 10-13, 1973 (as *N. amazonensis);* Wollenweber, Fusaria Autogr. Del 684, 1930 (as *Corallomyces jatrophae).*

Notes: Synnemata of this species are very distinctive. They are red, branched, and at maturity the fertile tips are widely flated and discoidal. Macroconidia of Fusarium arise from the disc and measure 40-100 x 8-10 μm and are 3-7 septate. Möller (1901) and Samuels (1973) gave detailed descriptions. The illustrations provided by Möller leave no doubt as to the identity of the species.

12. **Nectria discophora** (Montagne) Montagne, Syn. Gen. Spec. Crypt. p. 224. 1856.

= *Sphaeria discophora* Montagne, Ann. Sci. Nat. Bot., Ser. 2, *3:* 353. 1835.

Conidial state: *Cylindrocarpon lucidum* Booth, Mycol. Pap., *104:* 21. 14 Dec. 1966.

Perithecia solitary or gregarious, broadly pyriform to nearly globose, 400-650 μm, red, becoming nearly black with a darker red mammiform, rounded apex and a smooth, often shining wall, not collapsing when dry; red in 3% KOH, yellow in 100% lactic acid. Perithecial wall ca 40 μm thick with an outer region ca 20 μm wide of hyphae ca 5 μm wide and walls ca 2 μm thick arranged in outwardly directed palisade; surface of the perithecial wall appearing pitted with cells 3-4 μm in diam and 1.5-2 μm thick. Asci cylindrical, 80-90 x 6-9 μm, apex with a prominent ring; ascospores uniseriate. Ascospores ellipsoidal to elliptic-fusiform, 13-17 x 5-7 μm, 1-septate, not constricted, smooth to spinulose, hyaline when discharged.

Habitat: on wood.

Distribution: Jamaica, Panama, Colombia, Peru, pantropical.

COLOMBIA: Depto. Antioquia, Aljibe, Providencia, Anorí, above Río Anorí, on bark, 16 Jul. 1974, *K. P. Dumont, J. H. Haines, L. F. Velásquez & R. Fonnegra CO-803* (COL, NY); Depto. Antioquia, Estación Forestal Experimental Piedras Blancas, on wood, 19 Jul. 1974, *K. P. Dumont, J. H. Haines & L. F. Velásquez CO-1605* (COL, NY); Depto. Cundinamarca, ca 100 Km from Bogota, on the Bogota-Villavicencio road, vía Cáqueza, ca 4.400

ft., on branch, 7 Jan. 1976, *K. P. Dumont, P. Buriticá & J. H. Luteyn CO-2278* (COL, NY). PANAMA: Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on twig, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-236* (NY). PERU: Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 165 Km from the intersection with Cuzco-Puno Rd, on bark, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1503* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 165 Km from the intersection with the Puno-Cuzco Rd, on bark, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1504* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 135 Km from the intersection of the Cuzco-Puno Rd, on branch, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1731* (NY, USM).

Illustrations: Booth, Mycol. Pap. 104: 21. fig. 11, pl. 2-K, 1966 (as *Cylindrocarpon lucidum*).

Notes: *Nectria discophora* has been confused with *N. jungneri* Hennings (Höhnel & Weese, 1910; Höhnel, 1913) and at least one specimen in PC identified by Montagne as *N. discophora* (Guyana: Leprieur, coll. nos. 1169 & 1173) is *N. jungneri*. The ascospores of *N. jungneri* are pronouncedly striate and measure 25-35 x ca 10 μm.

Nectria discophora belongs to the *N. mammoidea* Phillips & Plowright group (Booth, 1959). Although the group does contain such distinctive species as *N. jungneri*, other species in the group cannot be identified with certaintyunless their anamorphs are known; *N. discophora* and *N. mammoidea* are two such species. The anamorphs of both species are *Cylindrocarpon* spp.; colonies of *N. discophora* are white to grey becoming brown, while those of *N. mammoidea* (*Cylindrocarpon ianothele* Wollenweber) are vilot to purple and usually a purple pigment diffuses through potato-dextrose agar. In features of ascomatal morphology the two species are nearly identical, but ascospores of collections having white to brown colonies measure 13-18 x 5-17 μm on average, while those of collections having purple colonies measure 10-13 x 5-6 μm on average. There is enough overlapping in these measurements to make identification based entirely on the teleomorph uncertain. Although not recorded from Panama, *N. mammoidea* is common in the neotropics where it occupies habitats similar to those of *N. discophora*.

13. **Nectria haematococca** Berkeley & Broome, J. Linn. Soc., Bot., **14**: 116. 3 Dec. 1873.

Conidial state: *Fusarium solani* (Martius) Saccardo, Michelia, *2*: 296. 3 Mar. 1881.

Perithecia solitary to gregarious, superficial, red to orange, globose to broadly ovate, nonpapillate, 340-370 μm in diam, or 340-460 x 270-400 μm, with a prominently warted wall, collapsing by lateral pinching when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 60-100 μm wide with a pronnounced outer layer of circular to angular cells, 15-30 μm in diam, wall ca 2 μm thick, built up to form conical warts. Asci narrowly clavate, 65-90 x 7-12 μm, apex simple; ascospores biseriate above, uniseriate below. Ascospores ellipsoidal, 12-16 x 4-6 μm, 1-septate, striate, hyaline to pale brown and then collapsed (in lactic acid) when discharged.

Habitat: on wood, bark and herbaceous debris.

Distribution: Brazil, Dominica, Costa Rica, Panama, Colombia, Peru.

COLOMBIA: Depto. Antioquia, Aljibe, Providencia, Anorí, above Río Anorí, on herbaceous stem, 6 Jul. 1974, *K. P. Dumont, J. H. Haines, L. F. Velásquez & R. Fonnegra CO-779* (COL, NY); Depto. Valle, vicinity Km 20 from Cali on road between Cali and Buenaventura, on wood, 13 Jul. 1974, *K. P. Dumont, J. M. Idrobo & L. F. Velásquez CO-1209* (COL, NY); Depto. Cundinamarca, ca 28 mi from Bogota on the Bogota-El Colegio Rd, vía Salto de Tequendama, ca 6.000 ft., on monocot stem, 13 Jan. 1976, *K. P. Dumont, P. Buriticá, J. L. Luteyn & L. A. Molina CO-2553* (COL, NY); Depto. Cundinamarca, ca 28 mi from Bogota on the Bogota-El Colegio Rd, vía Salto de Tequendama, ca 6.000 ft., on monocot stem, 13 Jan. 1976, *K. P. Dumont, P. Buriticá, J. L. Luteyn & L. A. Molina CO-2579* (COL, NY). COSTA RICA: Coronado, dirt road Villa Aseptina, on bark, 16 Jun. 1962, *G. C. Carrol 22* (NY); Hot Spring, road to La Marina, near Villa Quesada, ca 1.500 ft., 11 Sept. 1964, *G. C. Carrol 652-A* (NY). DOMINICA: Springfield Estate, woods near the Bee House, 7 mi from Roseau, ca 1.200 ft., on bark on tree, 20 Jun. 1970, *R. P. Korf, J. B. Benson, J. R. Dixon, D. H. Pfister, A. Rossman & L. E. Skog CUP-DO 27* (CUP, NY). PANAMA: Canal Zone, Ancón Hill, ca 20-75 m, 22 Jun. 1935, *G. W. Martin 2010* (NY); Prov. Chiriquí, Valley of upper Río Chiriquí Viejo, ca 1.600-1.800 m, 28 Jun. 1935, *G. W. Martin 2086* (NY); Canal Zone, Barro Colorado Island, 20 Aug. 1952, *G. W. Martin & A. L. Welden 8563* (NY); Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on twig, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-236* (NY); Prov. Cocle, vicinity of La Mesa, 2.5 Km N of El Valle, ca 2.100 ft., on branch, 14 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-316* (NY); Prov. Cocle, vicinity of La Mesa, 2.5 Km N of El Valle, ca 2.100 ft., on branch, 14 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-327* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km N of El Valle, on road to Mata Ahogada, ca 2.000 ft., on wood, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-355* (NY);

Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle on road to Mata Ahogada, ca 2.000 ft., on branch, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-405* (NY); Prov. Veraguas, along road from Sta. Fe to Calovebora, Atlantic slope, vicinity Río Caloveborita, ca 16 Km from Sta. Fe, ca 1.000-2.500 ft., on fruit of palm, 18 Jan. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-606* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on petiole of leaf, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-714* (NY); Prov. Veraguas, eastern slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-717* (NY); Prov. Veraguas, eastern slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on branch, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-733* (NY); Prov. Veraguas, eastern slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on fruit, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-757* (NY); Prov. San Blas, trail from Pto. Obaldía to Armilia Indian Village, from sea level to ca 500 ft., on root, 21 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-834* (NY). PERU: Depto. Junín, along the La Merced-Satipo Rd, in the vicinity of Km post 53 from the intersection of the La Merced-Oxapampa Rd, ca 1.400 ft., on branch, 27 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood, P. Buriticá, G. Guzmán & D. R. Reynolds PE-135* (NY, USM); Depto. Junín, ca ½ hour drive from Satipo toward Calabaza, on the Satipo-Concepción Rd, ca 2.600 ft., on bark, 28 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-162* (NY); Depto. Huánuco, vicinity Km post 3 from Tingo María, on the Tingo María-Monzón Rd, ca 2.800 ft., on vine, 3 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-609* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 165 Km from the intersection with the Cuzco-Puno Rd, on wood, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1523* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 152 Km from the intersection with the Cuzco-Puno Rd, on petiole of ferns, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1593* (NY); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 135 Km from the intersection of the Cuzco-Puno Rd, on branch, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1771* (NY, USM).

Illustrations: Booth, Mycol. Pap. 64: 6, fig. 1, 1960; Booth, Genus Fusarium 47, fig. 7; pl. 3, 1971; Hanlin, Amer., J. Bot. 58: 106, figs. 1-7;

107, figs. 8-17; 109, figs. 18-23; 110, figs. 24-31; 111, figs. 32-37; 113, figs. 38-46; 114, figs. 47-52; 115, figs. 53-60, 1971; Samuels, Mem. New York Bot. Gard. 26 (3): 62, fig. 23-A; 63, fig. 24, 1976.

Notes: Samuels (1976-a) redescribed this species and listed many additional neotropical collections; Hanlin (1971) described perithecial ontogeny. Booth (1960, 1971) redescribed *Fusarium solani,* the conidial state of *N. haematococca. Fusarium solani* is a common soil inhabitant, world-wide in distribution, and is the cause of many diseases of plants.

14. **Nectria illudens** Berkeley in Hooker, Botany of the Antartic Voyage, **2** (2): 203. 1855.

Conidial state: *Fusarium illudens* Booth, Genus Fusarium p. 54. 1 Sep. 1971.

Perithecial solitary to gregarious, superficial, red orange to orange-yellow, globose, 400-700 μm, nonpapillate, with a prominently warted wall, not collapsing when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall up to 100 μm wide, with a prominent outer region of circular cells measuring 15-30 μm in diam; cells in surface view circular in outline, 15-30 μm in diam, wall 1-2 μm thick, built up to forme large warts. Asci clavate, 90-150 x 10-15 μm, apex simple, ascospores biseriate above and uniseriate below. Ascospores broadly ellipsoidal, 20-25 x 8-13 μm, 1 - septate, striate to smooth, hyaline to light brown when discharged.

Habitat: on wood and bark.

Distribution: New Zealand, Panama, Venezuela.

PANAMA: Prov. Chiriquí, Valley of upper Río Chiriquí Viejo, 1.600-1.800, 28 Jun. 1935, *G. W. Martin 2099* (NY). VENEZUELA: Edo. Miranda, between refugio "No te apures" and quebrada Los Palos Grandes, south facing slopes of La Silla, Parq. Nac. El Avila, on descorticated wood, 1 Jul. 1972, *K. P. Dumont, G. J. Samuels & B. Manara VE-3777* (NY).

Illustrations: Booth, Genus Fusarium p. 53, fig. 9, 1971; Dingley, Trans. & Proc. Roy. Soc. New Zealand 79: pl. 24, fig. 6, 1951.

Notes: Booth (1971) recorded the *Fusarium* state for this species from Nigeria and New Zealand. The present neotropical collections are apparently the firts records of the *Nectria* outside of Australasia; it is common in New Zealand.

15. **Nectria rigidiuscula** Berkeley & Broome, J. Linn. Soc., Bot., **14:** 116. 3 Dec. 1878.

= *Calonectria rigidiuscula* (Berkeley & Broome) Saccardo, Michelia, *1:* 313. 1 Jul. 1978.

Conidial state: *Fusarium desemcellulare* Brick, jahresber. Vereinigung Angew. Bot., *6:* 227. 1909.

Perithecia densely gregarious in groups of 10-20 (or more), superficial, on a well developed stroma, white to pale yellow, subglobose, 200-300 x 190-300 μm, with a prominently warted wall, collapsing by lateral pinching when dry, color not changing in 3% KOH, or 100% lactic acid. Perithecial wall width not measurable in whole mounts; cells at the surface circular in outline, 10-20 μm in diam, wall ca 2 μm thick, built up to form very large warts. Asci clavate 70-100 x 12-14 μm, generally 4 spored, apex simple; ascospores biseriate. Ascospores allantoid to reniform, 22-28 x 7-10 μm, 3 - septate, smooth, hyaline when discharged.

Habitat: on a wide variety of woody plants.

Distribution: Jamaica, Puerto Rico, Panama, Venezuela, pantropical.

JAMAICA: St. Andrew Parish, along bridle path from Newcastle to Gordontown, below point where trail crosses road to Newcastle, on wood, 20 Jan. 1971, *R. P. Korf, J. R. Dixon, K. P. Dumont, R. W. Erb, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 949* (CUP, NY). PANAMA: Prov. Chiriquí, Valley of upper Río Chiriquí Viejo, ca 1.600-1.800 m, 28 Jun. 1935, *G. W. Martin 2101* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on bark, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-372* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on branch, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-405* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on branch, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-417* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on branch, 15 Jun. 1976, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-424* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on branch, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-733* (NY). PUERTO RICO: Maricao, woods near Maricao, Fish Hatchery, ca 460 m, on bark of *Eugenia jambos,* 16 Jun. 1970, *R. P. Korf, J. B. Benson, J. R. Dixon, J. H. Haines, D. H. Pfister, A. J. Rossman, A. Sánchez & L. E. Skog CUP-PR 4154* (CUP, MAPR, NY). VENEZUELA: Edo. Mérida, ca 13 Km E of Caño Zancudo, on La Azulita-Caño Zancudo Rd, on leaf, 22 Jul. 1971, *K. P. Dumont, G. J.*

Samuels & L. Borjas VE-2747 (NY); Edo. Sucre, along Río Aguas Calientes, ½ hour walk N of Maraval, NW of Irapa, on bark, 8 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & A. Villegas VE-4358* (NY); Edo. Sucre, trail between Los Pocitos and the Peak of Cerro Humo, NW of Irapa, on wood, 12 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & J. Farfán VE-4827* (NY); Edo. Sucre, trail from El Rincón east along Río Media to Peak of El Palo de Agua, on bark, 15 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & J. Carreno VE-5120* (NY, VEN); Edo. Monagas, La Carmelita, Hacienda Las Acacias, SE of Caripe, on wood, 17 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & F. Malave VE-5225* (NY, VEN); Edo. Monagas, La Carmelita, Hacienda Las Acacias, SE of Caripe, on wood, 17 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & F. Malave VE-5246* (NY).

Illustrations: Booth, Genus Fusarium p. 76, fig. 19, 1971.

Notes: Booth (1971) redescribed this species and discussed its pathogenicity. *Nectria rigidiuscula* is found on a wide range of plants where it may be saprophytic or parasitic.

16. **Nectria ochroleuca** (Schweinitz) Berkeley, Grevillea, **4:** 16. 1975.

= *Sphaeria ochroleuca* Schweinitz, Trans. Amer. Philos. Soc. n. s., *4:* 208. 1832.

= *Nectria gliocladioides* Smalley & Hansen, Mycologia, *49:* 533. 1957.

Conidial state: *Gliocladium roseum* Bainier, Bull. Soc. Mycol. France, *23:* 111. 15 Jul. 1907.

Perithecia cespitose, in groups of from 2-30 or more, seated upon a stroma or superficial, yellow to orange or nearly brown, globose to pomiform, 250-310 μm, nonpapillate, with a smooth of slightly scaly wall, collapsing by lateral pinching when dry, color not changed in 3% KOH or 100% lactic acid. Perithecial wall 35-45 μm wide, with an outer region measuring 20-40 μm in width and composed of textura angularis, cells 7-10 μm in greatest dimension, cells at the surface textura angularis, 7-10 μm in greatest dimension, thin-walled, each cell containing a single yellow droplet. Asci narrowly clavate, 50-65 x 5-9 μm, apex with a ring; ascospores biseriate above, uniseriate below. Ascospores fusiform to ellipsoidal, 10-13 x 3-4 μm, 1 - septate, not constricted, spinulose, hyaline when discharged.

Habitat: on wood, bark and herbaceous debris.

Distribution: Panama, Peru, cosmopolitan at temperate and tropical latitudes although far more common in the tropics.

PANAMA: Canal Zone, Barro Colorado Island, 11 Jul. 1952, *G. W. Martin & A. L. Welden 7608* (NY); Canal Zone, Carundú, 13 Aug. 1952, *G. W. Martin & A. L. Welden 8332* (NY); Prov. Panama, summit of Cerro Jefe, ca 23 Km N of Pan American Highway, ca 3.000 ft., on herbaceous stem, 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-62* (NY); Prov. Panama, summit of Cerro Jefe, ca 23 Km N of Pan American Highway, ca 3.000 ft., on frond of palm, 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-63* (NY); Prov. Panama, summit of Cerro Jefe, ca 23 Km N of Pan American Highway, ca 3.000 ft., on fruit stalk of *Carludovica* sp., 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-82* (NY); Prov. Cocle, from base Cerro Pilón to summit, 5 Km NE of El Valle, ca 2.000-3.000 ft., on log, 14 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-250* (NY); Prov. Chiriquí, vicinity of Aguacate, ca 7 Km NE from El Hato del Volcán-Cerro Punta Rd, ca 6.500 ft., on herbaceous stem, 4 Jul. 1975, *K. P. Dumont & S. E. Carpenter PA-2136* (NY). PERU: Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 165 Km from the intersection with the Cuzco-Puno Rd, on Pyrenomycete on bamboo culm, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1529* (NY); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 165 Km from the intersection with the Cuzco-Puno Rd, on branch, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1571* (NY, USM).

Illustrations: Dingley, Trans. & Proc. Roy. Soc. New Zealand 79: pl. 23, fig. 1, 1951; Hanlin, Amer. J. Bot. 48: p. 901, figs. 1-13; p. 903, figs. 14-22; p. 904, figs. 23-28; p. 906, figs. 29-44, 1961 (as *Nectria gliocladioides);* Samuels, Mem. New York Bot. Gard. 26 (3): 62, fig. 23-B; 70, fig. 25, 1976; Smalley & Hansen, Mycologia 49; 530, figs. 1-6; 532, figs. 7-12, 1957 (as *Nectria gliocladioides).*

Notes: Samuels (1976-a) redescribed the species and listed several synonymus; Hanlin (1961) described perithecial ontogeny.

17. **Nectria aureofulva** Cooke & Ellis, Grevillea, 7: 8. 1878.

Conidial state: *Dendrodochium* sp.

Perithecia solitary or cespitose in groups of from 2-20 or more, seated on a stroma or superficial, orange, globose to pomiform, 370-400 μm in diam, or 370-400 x 340-370 μm, nonpapillate, with a scaly or smooth wall, collapsing by lateral pinching when dry, color not changing in 3% KOH or 100% lactic acid. Perithecial wall 40-50 μm wide, with an outer region 20-25 μm in width, composed of textura angularis, cells 7-10 μm in greatest dimension, thin-walled, built up as scales. Asci narrowly clavate, 55-85 x 7-9 μm, apex with a ring;

ascospores biseriate above, uniseriate below. Ascospores ellipsoidal to fusoid-ellipsoidal, 12-18 x 4-5 μm, 1 - septate, not constricted, spinulose, hyaline when discharged.

Habitat: on wood and bark.

Distribution: New Zealand, U.S.A., Jamaica, Panama, Venezuela, Peru.

PANAMA: Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on branch, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. M. Mori PA-720* (NY). PERU: Depto. Junín, ca 147 Km from Huancayo, on the Huancayo-Satipo Rd, 10.000 ft., on branch, 9 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1337* (NY, USM).

Illustrations: Samuels, Mem. New York Bot. Gard. 26 (3): 62, fig. 23-D; 80, fig. 27, 1976.

Notes: Samuels (1976-a) redescribed *N. aureofulva* which is difficult to distinguish from *N. ochroleuca*. *Nectria aureofulva* usually has scaly perithecia and slightly larger spores than *N. ochroleuca*. The conidial state of *N. aureofulva* is an orange, well developed sporodochium.

18. **Nectria byssicola** Berkeley & Broome, J. Linn. Soc., Bot., **14:** 116. 3 Dec. 1873.

= ? *Nectria manihotis* Rick *in* Theissen, Ann. Mycol., *8:* 458. 31 Aug. 1910.

Conidial state: *Dendrodochium* sp.

Perithecia in cespitose groups of 2-10 or more, seated on erumpent stroma; pale orange with large, light colored warts, globose, nonpapillate, 280-340 μm in diam, collapsing by lateral pinching or not collapsing when dry, color not changing in 3% KOH or 100% lactic acid. Perithecial wall 30-45 μm wide, with an outer region 15-30 μm thick, composed of textura angularis, cells measuring 7-10 μm in greatest dimension, wall ca 1 μm thick; cells at the surface textura angularis, 7-10 μm in greatest dimension, simple; ascospores uniseriate above, biseriate below, or biseriate throughout. Ascospores ellipsoidal to elliptic-fusiform, 11-14 x 4-5 μm, 1 - septate, not constricted, spinulose, hyaline when discharged.

Habitat: on bark.

Distribution: Sri Lanka, Jamaica, Dominica, Costa Rica, Panama, Venezuela, Galapagos Islands.

PANAMA: Canal Zone, east of Arraiján, 14 Aug. 1952, *G. W. Martin & A. L. Welden 8379* (NY); Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on branch, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-168* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-721* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-726* (NY); Prov. Panama, vicinity Altos de Pácora, 26-31 Km N of Pan American Highway, on old road to Mandinga, ca 2.100-2.200 ft., on bark, 30 Jun. 1975, *K. P. Dumont, S. E. Carpenter & S. A. Mori PA-1570* (NY); Prov. Panama, vicinity Altos de Pácora, 26-31 Km N of Pan American Highway, on old road to Mandinga, ca 2.100-2.200 ft., on twig, 30 Jun. 1975, *K. P. Dumont, S. E. Carpenter & S. A. Mori PA-1587* (NY).

Illustrations: Samuels, Mem. New York Bot. Gard. 26 (3): 62, fig. 23-C; 77, fig. 26, 1976.

Notes: Samuels (1976-a) redescribed the species.

19. **Nectria subquaternata** Berkeley & Brome, J. Linn. Soc., Bot., **14:** 116. 3 Dec. 1873.

Conidial state: *Dendrodochium* sp.

Perithecia cespitose in groups of from 2-75, seated on a barely erumpent stroma, pale orange with lighter colored scales, globose, nonpapillate, 460 μm in diam, becoming collabent when dry, color not changing in 3% KOH or 100% lactic acid. Perithecial wall 50-70 μm wide, with an outer region 35-55 μm wide composed of textura globulosa, cells 7-10 μm in diam, thin-walled; cells at surface textura globulosa, 7-10 μm in diam, thin-walled. Asci narrowly clavate, 60-75 x 10-12 μm, apex simple; ascospores biseriate above, uniseriate below. Ascospores ellipsoidal, 15-17 x 6-7 μm, 1-septate, not constricted, striate, hyaline when discharged.

Habitat: on bark.

Distribution: Sri Lanka, New Zealand, Panama, Brazil.

BRAZIL: Rio Grande do Sul, Nova Petropolis, Mar 1923, *J. Rick* s. j. (BPI, NY). PANAMA: Prov. Cocle, vicinity of La Mesa, 2.5 Km N of El Valle, ca 2.100 ft., on branch, 14 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-327* (NY). SRI LANKA: Taken from the sheet

in K with the type specimen of *N. subquaternata*. This specimen is in a packet labeled Ceylon 173-d and is the portion identified by Höhnel, and by Berkeley as *N. byssicola*. This is *N. subquaternata* annotated by G. J. Samuels (K, NY).

Illustrations: Samuels, Mem. New York Bot. Gard. 26 (3): 84, fig. 29, 1976.

Notes: Samuels (1976-a) redescribed the species and discussed its relationships to *Nectria byssicola*, with which it has been confused. Recent isolates of solitary ascospores from New Zealand collection produced a *Dendrodochium* stage in culture.

20. **Nectria olivacea** (Seaver) Samuels, Canad. J. Bot., **51:** 1277. 1973.

= *Macbridella olivacea* Seaver, Mycologia, *2:* 178. 15 Jul. 1912.

= *Phaeonectria olivacea* (Seaver) Saccardo & Trotter, Syll. Fung., *22:* 485. 20 Aug. 1913.

= *Macbridella cinnabarina* Seaver in Seaver & Chardon, Sci. Surv. Porto Rico and Virgin Islands, *8:* 43. 29 Dec. 1926.

Conidial state: ? *Dendrodochium* sp.

Perithecia cespitose in groups of from 5-10, seated on a barely erumpent stroma, orange to red, with orange or green warts, broadly ovate, 310-375 μm in diam, with a short, rounded papilla, collapsing by lateral pinching when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall 20-30 μm wide, not differentiated into regions, cells at the surface textura angularis, 7-10 μm in largest dimension, wall ca 1 μm thick, built up as warts. Asci cylindrical, 75-105 x 6-8 μm, apex simple; ascospores uniseriate. Ascospores fusoid-ellipsoidal, 12-15 x 5-7 μm, 1 - septate, constricted, coarsely striate, light brown when discharged.

Habitat: on bark.

Distribution: Puerto Rico, Mexico, Panama.

MEXICO: Motzorongo, near Córdoba, moist virgin forest on mountain side, 800-1.500 ft., 15 Jan. 1910, *W. A. Murrill & Edna L. Murrill 911 (Holotype Macbridella olivacea,* NY). PANAMA: Prov. Chiriquí, Valley of upper Río Chiriquí Viejo, ca 1.600-1.800 m, 4 Jul. 1935, *G. W. Martin 2464* (NY); Prov. Cocle, El Valle de Antón, ca 600-700 m, 24 Jul. 1935, *G. W. Martin 2972* (NY). PUERTO RICO: N. Y. Bot. Gard. West Indian Exploration, 24 Jan. - 5 Apr. 1923, *F. J. Seaver & C. E. Charddon 525* (NY) *(Lectotype* and *Syntype Macbridella cinnabarina,* NY).

Illustrations: Samuels, Canad. J. Bot. 51: 1277, figs. 5-9; pl. 1, figs. 26, 27, 1973; Seaver, Mycologia 2: pl. 30, figs. 6-13, 1910 (as *M. olivacea)*.

Notes: Samuels (1973-b) redescribed the species. Seaver (1910) described a *Dendrodochium* —like conidial state produced from ascospores. The conidiophores arise from a light-colored, effused sporodochium. Globose to subglobose conidia measuring 4-5 μm in diam are produced in chains from penicillately arranged phialides. The coarsely striate, light brown ascospores characterize the species.

21. **Nectria pityrodes** (Montagne) Montagne, Syll. Gen. Spec. Crypt. p. 224. 1856.

= *Sphaeria pityrodes* Montagne in Sagra, Hist. Phys. Pol. Pl. Nat. Cuba, *9:* 333. 1841.

= *Nectria albicans* Starback, Bih. Kongl. Svensk. - Akad. Handl., *25* (3): 28. 11 Jan. 1899.

= *Nectria juruensis* Hennings, Hedwigia, *43:* 244. 12 Jun. 1904.

= *Creonectria macrosporicola* Chardon, Bol. Soc. Venez. Ci. Nat., *5:* 242 (332). 1939.

Conidial state: *Myrothecium* sp.

Perithecia cespitose, usually in groups of 2-7, seated on an erumpent stroma, orange warted, globose, nonpapillate, 550-660 μm in diam, cupulate when dry, not changing in color in 3% KOH or 100% lactic acid. Width of perithecial wall not measurable in whole mounts; cells at the surface textura angularis to nearly circular in outline, 7-10 μm in diam, wall ca 1 μm thick. Asci fusiform, 80-100 x 20-25 μm, apex simple; ascospores biseriate. Ascospores allantoid to broadly elliptical, 25-32 x 9-10 μm, 1 - septate, smooth, hyaline when discharged.

Habitat: on bark.

Distribution: Panama, Colombia, Peru, Brazil.

Brazil: *Syntype of Nectria juruensis* (FH). Colombia: Depto. Boyacá, vicinity Km post 165, on the Chocontá-Agua Clara Rd, ca 1.400 ft., on bark, 11 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & L. A. Molina CO-4779* (COL, NY). Panama: Prov. Panama, vicinity Altos de Pácora, 26-31 Km N of Pan American Highway, on old road to Mandinga, ca 2.100-2.200 ft., on bark, 30 Jun. 1975, *K. P. Dumont, S. E. Carpenter & S. A. Mori PA-1621* (NY). Peru: Depto. Huánuco, vicinity Km post 469 from Lima, on the Huánuco-Tingo María Rd, ca 7.100 ft., on wood, 2 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-503*

(NY, USM). VENEZUELA: Edo. Aragua, path between hotel and hotel's water source, Rancho Grande, Parq. Nac. Henry Pittier, on wood, 3 Jul. 1971, *K. P. Dumont, J. H. Haines & G. J. Samuels VE-1110* (NY); Edo. Mérida, Laguna Negra, E of Laguna Mucubaji, Parq. Nac. Sierra Nevada, near Apartaderos, on tree *Espeletia* sp., 18 Jul. 1971, *K. P. Dumont, J. H. Haines, G. J. Samuels & A. Revas VE-2290* (NY, VEN); Edo. Miranda, vicinity of El Bachiller, ca 19 Km W of a point where Río Cupira crosses Rte. 9, between Caracas and Cumaná, on vine, 5 Jul. 1972, *K. P. Dumont, G. J. Samuels, R. F. Cain & G. Morillo VE-3935* (NY). *Syntypes of Creonectria macrosporicola* (CUP, BPI).

Illustrations: Chardon, Bol. Soc. Venez. Ci. Nat. 5: pl. 1, fig. 3, 1939 (as *C. macrosporicola).*

Notes: Solitary ascospores isolated from Brazilian and Venezuelan collections produced a Myrothecium state in culture. The large, orange, cupulate, warted perithecia and the large, smooth, hyaline ascospores readily characterize this species.

22. **Nectria suffulta** Berkeley & Curtis, J. Linn. Soc., Bot., **10:** 378. 1869 (1868).

Conidial state: *Acremonium* sp.

Perithecia solitary or in groups of from 2-4, superficial on the substrate; pale yellow, orange to brown; uniform, nonpapillate, 310-370 μm high x 400-500 μm across the flat top, with long, fasciculate, triangular hairs scattered over the perithecial wall, cupulate when dry, not changing in color in 3% KOH or 100% lactic acid. Perithecial wall 55-90 μm thick, outer region 40-75 μm thick, composed of circular to angular cells measuring 15-20 μm in diam with thin walls; cells at the surface circular to angular in outline, 15-20 μm in diam, thin walled. Asci narrowly clavate, 55-75 x 9-11, apex simple; ascospores biseriate above, uniseriate below or biseriate throughout. Ascospores ellipsoidal to subfusiform, 12-17 x 4-5 μm, 1 - septate, hyaline when discharged.

Habitat: on wood, herbaceous debris or other fungi.

Distribution: Cuba, Panama, Colombia, Ecuador, Peru, pantropical.

COLOMBIA: Depto. Cundinamarca, Robledal, between Km post 16-17 from Mosquera, on the Mosquera-La Mesa Rd, ca 8.600 ft., on branch, 21 Dec. 1975, *K. P. Dumont & J. M. Idrobo CO-2030* (COL, NY). CUBA: On palm rachis, *Wright 632 (Isotype Nectria suffulta,* K, FH). ECUADOR: Prov. Pichincha, ca 37 Km SW of Chillogallo, on the old road from Quito to Santo Domingo, ca 7.600 ft., on herbaceous stem, 16 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-135* (NY); Prov. Pichincha, ca 137 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.600 ft.,

on herbaceous stem, 16 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-163* (NY); Prov. Pichincha, ca 39 Km SW of Chillogallo, on the old road from Quito to Sto. Domingo, ca 7.200 ft., on twig, 17 Jul. 1975, *K. P. Dumont, S. E. Carpenter & P. Buriticá EC-207* (NY). PANAMA: Canal Zone Ancon Hill, 20 Jul. 1935, *G. W. Martin 2893* (NY); Canal Zone, Summit Gardens, Balboa Heights, ca 300 ft., on burned palm, 12 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-476* (NY); Prov. Veraguas, along road from Sta. Fe to Calovebora, Atlantic Slope, vicinity Río Caloveborita, ca 16 Km from Sta. Fe, ca 1.000-2.500 ft., on herbaceous stem, 18 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-634* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-740* (NY); Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano - Cartí Rd, ca 1.000-1.300 ft., on burned banana stalk, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1280* (NY); Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano - Cartí Rd, ca 1.000-1.300 ft., on petiole of palm, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1313* (NY); Prov. Panama, 2-3 Km N of Pan American Highway, on El Llano - Cartí Rd, ca 600-800 ft., on monocot stem, 29 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1438* (NY); Prov. Panama, 2-3 Km N of Pan American Highway, on El Llano - Cartí Rd, ca 600-800 ft., on herbaceous stem, 29 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter PA-1444* (NY); Prov. Chiriquí, vicinity Aguacate, ca 7 Km NE from El Hato del Volcán, Cerro Punta Rd, ca 6.500 ft., on herbaceous stem, 4 Jul. 1975, *K. P. Dumont & S. E. Carpenter PA-2194* (NY). PERU: Depto. Junín, along the La Merced-Satipo Rd, in the vicinity Km post 53 from the intersection of the La Mesa-Oxamampa Rd, ca 1.400 ft., on stalk of palm, 27 Jun. 1976, *K. P. Dumont, S. E. Carpenter, P. Buriticá, M. A. Sherwood, G. Guzmán & D. R. Reynolds PE-125* (NY, USM); Depto. Junín, just outside Calabaza toward Satipo, on the Satipo-Concepción Rd, ca 5.000 ft., on wood, 28 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-244* (NY, USM); Depto. Huánuco, vicinity Km post 3 from Tingo María-Monzón Rd., ca 2.800 ft., on branch, 3 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-589* (NY, USM); Depto. Huánuco, vicinity Km post 3 from Tingo María, on the Tingo María-Monzón Rd, 2.800 ft., on vine, 3 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-611* (NY, USM); Depto. Huánuco, ca 40 Km from Tingo María, on the Tingo María-Pucallpa Rd, ca 6.200 ft., on vine, 4 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-847* (NY, USM); Depto. Loreto, ca 7 Km from Tingo María, on the Pucallpa-Tingo María Rd, ca 2.400 ft.,

on herbaceous stem, 4 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-899* (NY, USM); Depto. Huánuco, ca 5 Km from Tingo María, on the Tingo María-Monzón Rd, Parque Nacional Tingo María, ca 2.600 ft., on twig, 6 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1047* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 186 Km from the intersection of the Cuzco-Puno Rd, on herbaceous stem, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1399* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point 186 Km from the intersection of the Cuzco-Puno Rd, on inflorescence of *Heliconia* sp., 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1436* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 152 Km from the intersection with the Cuzco-Puno Rd, on herbaceous stem, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1589* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 152 Km from the intersection with the Cuzco-Puno Rd, on herbaceous stem, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1592* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 135 Km from the intersection of the Cuzco-Puno Rd, on herbaceous stem, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1774* (NY, USM).

Illustrations: Dennis, British Ascomycetes, pl. 27, fig. L, 1968 (as *Neohenningsia suffulta);* Massee and Salmon, Ann. Bot. (London) 16: pl. 4, figs. 29-32, 1902 (as *Nectria ornata);* Raunkiaer, Bot. Tidsskr. 29: pl. 1, fig. 4, 1908 (as *Nectria setosa);* Samuels, Mem. New York Bot. Gard. 26 (3): 46, fig. 16-B; 52, fig. 18, 1976; Seaver, Mycologia 20: pl. 12, figs. 1-4, 1928; Verona and Benedek, Mycopathol. & Mycol. Appl. Suppl. Icon Mycol. 24: pl. C384, fig. I, 1969; Weese, Sitzunsber, Kaiserl, Akad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 125: 518, pl. 2, fig. 1, 1916.

Notes: Samuels (1976-a) and Gammundi (1974) redescribed the species. *Nectria suffulta* and *N. cyatheae* Dingley are superficially indistinguishable. The ascospores of *N. cyatheae* are 17-23 x 5-7 μm, while those of *N. suffulta* are 12-17 x 4-5 μm. *Nectria cyatheae* has recently been collected in Ecuador *(Dumont et al. EC-153)* and Peru *(Dumont et al. PE-844)* on fern rachises at altitudes greater than 6.000 ft. Previously *N. cyatheae* was known only from New Zealand on rachises of *Cyathea medullaris* (Forst. f.) Swartz, and has been redescribed by Samuels (1976-b).

23. **Nectria subfalcata** Hennings, Hedwigia, **41**: 4. 5 Mar. 1902.

= *Nectria heliconiae* E. Muller in Dennis, Kew Bull., *19:* 383. 26 Jul. 1965.

Conidial state: *Acremonium* sp.

Perithecia solitary or in cespitose aggregates of from 2-30, orange, globose, 480-520 μm in diam, completely enclosed in white hyphae and appearing like a stroma of species of *Hypocrea,* becoming slightly cupulate when dry, not changing color in 3% KOH or 100% lactic acid; hyphae arising from the perithecial wall, straight, 4-5 μm in diam with wall ca 2 μm thick. Perithecial wall 15-20 μm wide, not differentiated into regions; cells at the surface obscured by the hyphal covering. Asci fusiform to clavate, 140-180 x 15-20 μm, apex simple; ascospores biseriate. Ascospores fusiform, 50-70 x 7-8 μm, 1-septate, smooth, hayline when discharged.

Habitat: on decaying herbaceous debris, specially of *Musa* and *Heliconia* species.

Distribution: Republic Dominicana, Ecuador, Jamaica, Panama, Colombia, Venezuela, Peru, Brazil.

Brazil: Sta. Catharina, Blumenau, Jan. 1981. *A. Möller s. n.* (NY, S, *holotype Nectria subfalcata).* Colombia: Depto. Antioquia, Aljibe, Providencia, Anorí, above Río Anorí, ca 400-800 m, on flower inflorescense of Zingiberaceae, 6 Jul. 1974, *K. P. Dumont, J. H. Haines, L. F. Velásquez & R. Fonnegra CO-809* (COL, NY). Panama: Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on banana trunk, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-147* (NY); Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on banana stalk, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-196* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-712* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-741* (NY); Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 1.000-1.300 ft., on banana, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1285* (NY); Prov. Panama, 2-3 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 600-800 ft., on banana, 29 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1370* (NY); Prov. Panama, 2-3 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 600-800 ft., on monocot leaf, 29 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1404* (NY); Prov. Panama, 2-3 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 600-800 ft., on monocot stem, 29 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1412* (NY). Peru: Depto. Junín, ca ½ hour

drive from Satipo toward Calabaza, on the Satipo-Concepción Rd, ca 2.600 ft., on banana, 28 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-168* (NY, USM); Depto. Loreto, ca 71 Km from Tingo María, on the Pucallpa-Tingo María Rd, ca 2.400 ft., on banana, 4 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-893* (NY, USM); Depto. Loreto, vicinity Guacamayo, on the Río Guacamayo, along the Tingo María-Pucallpa Rd, ca 1.500 ft., on inflorescence of *Heliconia* sp., 5 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-950* (NY, USM); Depto. Loreto, vicinity Guacamayo, on the Río Guacamayo, along the Tingo María-Pucallpa Rd, ca 1.500 ft., on leaf of *Musa* sp., 5 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-999* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 186 Km from the intersection of the Cuzco-Puno Rd, on *Heliconia* sp., 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1417* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 186 Km from the intersection of the Cuzco-Puno Rd, on *Heliconia* sp., 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1420* (NY, USM).

Illustrations: Dennis, Kew Bull. 19: 362, fig. 4; 368, figs. n, o, 1965 (as *N. heliconiae);* Samuels, Mem. New York Bot. Gard. 26 (3): 33, fig. 9-Z; 34, fig. 10, 1976.

Notes: Samuels (1976-a) redescribed the species which is one of the most common and distinctive species of *Nectria* in the Neotropics.

24. **Nectria pertusa** Patouillard in Patouillard & Lagerheim, Bull. Soc. Mycol. France, **11:** 227. 1895.

= *Nectria aemulans* Rehm, Ann. Mycol., *7:* 539. 31 Dec. 1909.

Perithecia in cespitose aggregates of from 3-25, orange, globose, 230-250 μm in diam, becoming slightly cupulate when dry, not changing in color in 3% KOH or 100% lactic acid, completely enclosed in white hyphae and appearing like the stroma of a species of Hypocraea; hyphae sinous, 4-5 μm in diam with wall ca 2 μm thick; arising from the perithecial wall. Perithecial wall 15-20 μm wide, not differentiated into regions; cells at the surface obscured by the hyphal covering. Asci narrowly clavate, 70-80 x 9-12 μm, apex simple; ascospores biseriate. Ascospores ellipsoidal to elliptic fusiform, 13-17 x 4-5 μm, 1-septate, with 3-4 striations visible in one plane of view and running the length of each ascospore, hyaline when discharged.

Habitat: on decaying herbaceous debris.

Distribution: New Zealand, Puerto Rico, Mexico, Dominica, Panama, Venezuela, Colombia, Ecuador, Brazil.

COLOMBIA: Depto. Cundinamarca, ca 16 Km from Mosquera-La Mesa Rd, ca 8.200 ft., on fern frond, 3 Jan. 1976, *K. P. Dumont, J. L. & M. L. Luteyn CO-2119* (COL, NY). ECUADOR: San Jorge, Tiges of *Chusquea* sp., Jul. 1972, *de Lagerheim s. n.* (FH, NY, *holotype Nectria pertusa)*. PANAMA: Prov. Chiriquí, Valley of upper Río Chiriquí Viejo, on bamboo, 5 Jul. 1935, *G. W. Martin 2510* (NY); Prov. Chiriquí, Casita Alta, above Boquete, 31 Jul. 1952, *G. W. Martin & L. A. Welden 8066* (NY).

Illustrations: Samuels, Mem. New York Bot. Gard. 26 (3): 33, figs. 9-B, C; 37, fig. 12, 1976; Samuels, New Zealand, J. Bot. 14: 240, fig. 2; 256, fig. 13; 258, fig. 25, 1976.

Notes: Samuels (1976-a, b) redescribed the species.

25. **Nectria foliicola** Berkeley & Curtis, J. Linn. Soc., Bot., **10:** 379. 1869 (1868).

Conidial state: *Acremonium* sp.

Perithecia solitary or in cespitose aggregates of from 2-7, brown, globose to urniform, 224-275 μm in diam, becoming cupulate when dry, not changing color in 3% KOH or 100% lactic acid; completely enclosed in straight, unbranched, smooth, tan hyphae, up to 80 μm long and ca 3 μm in diam, with wall ca 1 μm thick, arising from the perithecial wall. Perithecial wall 15-20 μm wide, not differentiated into regions; cells at the surface obscured by the hyphal covering. Asci clavate to fusiform, 60-80 x 10-12 μm, apex simple; ascospores biseriate. Ascospores fusiform 21-27 x 4-5 μm, 1-septate, striate, hyaline when discharged.

Habitat: on decaying herbaceous debris, especially of *Musa* and *Heliconia* species.

Distribution: Cuba, Costa Rica, Panama, Colombia, Venezuela.

COLOMBIA: Depto. Cundinamarca, El Bosque de Tibabita, E Jardines de Paz, on culm of *Chusquea* sp., 28 Jun. 1974, *K. P. Dumont, J. H. Haines, J. M. Idrobo & L. F. Velásquez CO-40* (COL, NY). COSTA RICA: San José, Km 55 S of San José, Interamerican Highway, 7.600 ft., on *Puya dasylitioides,* 3 Sep. 1964, *G. C. Carrol 898* (NY). CUBA: Leaf of *Musa* sp., *C. Wright 752* (FH, NY, K, *isotype of N. foliicola)*. PANAMA: Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 1.000-1.300 ft., on peduncle of fruit, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1266* (NY).

Illustrations: Samuels, Mem. New York Bot. Gard. 26 (3), fig. 9-D; 40, fig. 13, 1976.

Notes: Samuels (1976-a) redescribed the species. Ascospores isolated from two Venezuelan collections did not produce a conidial state. Other species closely related to *Nectria foliicola* produce Acremonium states (Samuels, 1976-a, b).

26. **Nectria sylvana** Mouton, Bull. Soc. Roy. Bot. Belgique, **39:** 49. 1900.
= *Neohenningsia stellatula* Koorders, Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweedie Sectie, *13* (4): 164. 1907.
= *Neohenningsia brasiliensis* Hennings, Hedwigia, *48:* 102. 1909. (5 Sep. 1908).
= *Calonectria fimbriata* Seaver & Waterston, Mycologia, *32:* 404. 1 Jun. 1940.

Conidial state: *Acremonium* sp.

Perithecia solitary or in groups of from 3-4, superficial on the substrate, white to orange to brown, urniform 150-250 x 220-280 μm, becoming cupulate when dry, with fasciculate, triangular hairs scattered over the perithecial wall or forming a stellate apical crown, not changing color in 3% KOH or in 100% lactic acid. Perithecial wall 20-30 μm wide, not differentiated into regions; cells at the surface textura epidermoidea, wall 1-2 μm wide. Asci cylindrical to narrowly clavate, 45-70 x 7-9 μm, apex with a ring; ascospores biseriate above, uniseriate below to biseriate throughout. Ascospores fusoid-ellipsoidal, 11-15 x 3-4 μm, equally 2-celled, not constricted or slightly constricted at the septum, striate hyaline when discharged.

Habitat: on decaying herbaceous debris, less frequently on bark.

Distribution: U.S.A., Germany, New Zealand, Belgium, Bermuda, Panama, Colombia, Peru, Brazil.

BELGIUM: *Holotype of Nectria sylvana* (BR). BERMUDA: Smith's Parish, on Foeniculum vulgare, 9 Dec. 1938, *F. J. Seaver & J. M. Waterston s. n.* (NY, *holotype of Calonectria fimbriata).* BRAZIL: Tige of Angelica 21 (FH, NY, *isotype of Neohenningsia brasiliensis).* COLOMBIA: Depto. Cundinamarca, vicinity Km 15 from Fómeque, road between Calera and Fómeque, on *Neurolepsis* sp., 10 Jul. 1974, *K. P. Dumont, J. H. Haines, J. M. Idrobo & L. F. Velásquez CO-969* (COL, NY). PANAMA: Prov. Panama, summit of Cerro Jefe, ca 23 Km N of Pan American Highway, ca 3.000 ft., on herbaceous stem, 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-62* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta.

Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on fern, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-647* (NY); Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on herbaceous stem, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-751* (NY); Prov. Chiriquí, bamboo and oak forest at La Cumbre, 3-4 Km N of town of Cerro Punta, ca 7.300-7.500 ft., on leaf, 3 Jul. 1975, *K. P. Dumont & S. E. Carpenter PA-1818* (NY). PERU: Depto. Huánuco, vicinity Km post 450 from Lima, on the Huánuco-Tingo María Rd, ca 8.500 ft., on rachis of fern, 2 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-403* (NY, USM); Depto. Huánuco, ca 40 Km from Tingo María, on the Tingo María-Pucallpa Rd, ca 6.200 ft., on vine, 4 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-847* (NY, USM); Depto. Cuzco, along the Cuzco-Pilcopata-Paucartambo Rd, at a point ca 152 Km from the intersection with the Cuzco-Puno Rd, on herbaceous stem, 18 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1592* (NY); Depto. Cuzco, along the Cuzco- Pilcopata-Paucartambo Rd, at a point ca 135 Km from the intersection of the Cuzco-Puno Rd, on herbaceous stem, 19 Jul. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-1774* (NY, USM).

Illustrations: Gamundi, Darwiniana 18: 554, fig. 2, J-O, 1974 (as *Neohenningsia brasiliensis);* Samuels, Mem. New York Bot. Gard. 26 (3): 33, fig. 9-E; 42, fig. 14, 1976; Samuels, New Zealand J. Bot. 14: 248, fig. 7; 257, fig. 18; 259, fig. 30, 1976.

Notes: Samuels (1976-a, b) redescribed the species.

27. **Nectria peristomialis** (Berkeley & Broome) Samuels, New Zealand J. Bot., **14:** 251. 1976.

= *Peziza peristomialis* Berk. & Br., Ann. Mag. Nat. Hist., Ser., 3, *18:* 126. 1866.

= *Ijuhya vitrea* Starback, Bih. Kongl. Svenska. Vetensk. - Akad. Handl. 25, Afd. 3, no. *1:* 31. 1899.

= *Ijuhya vitrea* Starb. var *javanica* Höhnel, Sitzungsber. Kaiserl. Akad. Wiss., Math. - Naturwiss. Cl., Abt. 1, *121:* 380. 1912.

Conidial state: *Acremonium* sp.

Perithecia solitary, or in groups of from 2-4, superficial on the substrate, white with orange contents, globose, 200-370 μm in diam, with a very pronounced, white, stellate disc composed of triangular, fasciculate hairs, not collapsing when dry, not changing color in 3% KOH or 100% lactic acid.

Perithecial wall 30-40 μm wide, not differentiated into regions; cells at the surface textura epidermoidea, wall 1-2 μm thick. Asci clavate, 70-85 x 9-13 μm, apex simple; ascospores biseriate. Ascospores fusiform, 25-32 x 4-6 μm 1-2 (-5) septate, not constricted, or cells separating at the medium septum, with coarse ridge-like striations, hyaline when discharged.

Habitat: on decaying herbaceous debris, rarely in wood.

Distribution: England, New Zealand, Java, Panama, Colombia, Brazil.

BRAZIL: San Pablo, Bella Vista, on bamboo, Jul. 1907, *V. Höhnel* (S, *holotype* of *Ijuhya vitrea)*. COLOMBIA: Depto. Cundinamarca, ca 16 Km from Mosquera, on the Mosquera-La Mesa Rd, ca 8.200 ft., on fern front, 3 Jan. 1976, *K. P. Dumont, J. L. & M. L. Luteyn CO-2106* (COL, NY). ENGLAND: *Holotype* of *Peziza peristomialis* (K). JAVA: *V. Höhnel,* A 2950, Tjibodas, on bamboo, August 1907 (FH, *holotype* of *Ijuhya vitrea* var. *javanica)*. PANAMA: Prov. San Blas, along trail in mountains just W of Puerto Obaldía, ca 400 ft., on *Heliconia* sp., 23 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter PA-1089* (NY).

Illustrations: Gamundi, Darwiniana 18: 554, fig. 2, P-Q 1974 (as *Ijuhya vitrea);* Samuels, New Zealand J. Bot. 14: 252, fig. 9; 257, fig. 21; 259, fig. 32, 1976.

Notes: Gamundi (1974, as *Ijuhya vitrea)* and Samuels (1976-b) redescribed the species.

28. **Nectria macrostoma** Berkeley & Curtis in Berkeley, J. Linn. Soc., Bot., **10:** 378. 1869 (1868).

= *Stilbocrea macrostoma* (Berk. & Curtis) Höhnel, Sitzungsber. Kaiserl. Akad. Wiss., Math. - Naturwiss. Cl., Abt. 1, *118:* 1195. 1909.

= *Sphaerostilbe hypocreoides* Kalchbrenner & Cooke, Grevillea, *9:* 26. 1880.

= *Sphaerostilbe intermedia* Ferdinandsen & Winge, Bot. Tidsskr., *29:* 12. 1908.

= *Stilbocrea dussii* Patouillard, Bull. Soc. Mycol. France, *16:* 186. 1900 (28 Feb. 1901).

= *Nectria grisea* Dingley, Trans. Roy. Soc. New Zealand, *79:* 180. 1951.

Conidial state: *Stilbella* sp.

Perithecia in caspitose aggregates of many perithecia, superficial on the substrate, completely enclosed with a white, hyphal stroma, with just the orange papillate protruding, each aggregate looking like the stroma of a Hy-

pocreae, hyphae of stroma frequently septate, sinuous, with many free ends; white synnemata arising from each aggregate and a solitary, orange slime mass at the tip of each synnema. Perithecia orange, pyriform, 320-350 x 200-300 μm, with an acute apex, collapsing by lateral pinching when dry, not changing color in 3% KOH or 100% lactic acid. Perithecial wall ca 25 μm thick, not differentiated into regions; cells at the surface obscured by the hyphal stroma. Asci cylindrical, 65-80 x 7-11 μm, apex with a ring; ascospores uniseriate. Ascospores fusiform to fusoid-ellipsoidal, 1 - septate, slightly constricted, spinulose, hyaline when discharged.

Habitat: on bark and wood.

Distribution: Cuba, Jamaica, Puerto Rico, New Zealand, St. Thomas, St. John, Trinidad, Panama, Venezuela.

PANAMA: Prov. Panama, 2-3 Km N of Pan American Highway on El Llano-Cartí Rd, ca 600-800 ft., on log, 29 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter PA-1413* (NY).

Illustrations: Patouillard, Bull. Soc. Mycol. France 16: pl. 7, fig. 5, 1901 (as *Stilbocrea dussii).*

Notes: This species is easily identified by its extensive effused white to grey stroma and its synnemata. In Venezuela it is found at altitudes below 1.200 ft., where the climate is hot and often dry.

29. **Nectria myxomyceticola** Samuels, Mycologia, **65:** 409. 4 May 1973.

= *Hypomyces exiguus* Patouillard, Bull. Soc. Mycol. France, *18:* 180. 15 May 1902.

Conidial state: *Verticillium rexianum* (Saccardo) Saccardo, Syll. Fung., *4:* 153. 10 Apr. 1886.

Perithecia solitary; enclosed in cottony, white mycelium, seated on sporangia of myxomycetes. Perithecia white to pale yellow, globose to broadly ovate, 200-300 μm in diam, or 140-216 x 125-200 μm wide, collapsing by lateral pinching when dry. Perithecial wall 10-15 μm wide, not differentiated into regions; hairs inconspicuous, aculeate, spinulose, arising from the upper half of the perithecial wall; cells at the surface textura epidermoidea, thin walled. Asci cylindrical, 40-50 x 3-4 μm, apex with a ring; ascospores uniseriate. Ascospores oblong, 4.5-5.5 x 2-3 μm, 1 - septate, not constricted, smooth, hyaline when discharged.

Habitat: on sporangia of myxomycetes.

Distribution: England, Germany, Guadeloupe, Panama, Venezuela.

GUADELOUPE: On Stemonitis fusca Roth, *Duss 404, s. f.* (FH: Herb. Patouillard, NY, *type of Hypomyces exiguus* Pat). PANAMA: Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on myxomycete on log, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-227* (NY); Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on myxomycete on polypore, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-242.* VENEZUELA: Edo. Yaracuy, 2-4 Km above Jobito, near San Felipe, Parq. Yurubí, on *Stemonitis* sp., 10 Jul. 1971, *K. P. Dumont, J. H. Haines, G. J. Samuels & J. Leal VE-1846* (NY).

Illustrations: Gams, Cephalosporium-artige Schimmelpilze. p. 171, fig. 112, 1971 (as *Verticillium rexianum);* Samuels, Mycologia 65: 405, fig. 5; 410, figs. 16-20, 1973.

Notes: The perfect stage of *Nectria myxomyceticola* is rarely collected and is inconspicuous when it is present. Samuels (1973-a) redescribed the species.

30. **Nectria arenuloides** Samuels, New Zealand J. Bot., **14:** 254, 1976.

Conidial state: *Acremonium* sp.

Perithecia solitary, superficial on the substrate, white becoming orange, nonpapillate with a smooth wall, globose to tympaniform, 250-310 μm in diam, becoming cupulate when dry. Perithecial wall 50-60 μm wide, outer region 20-30 μm wide, cells textura angularis, wall 0.5 μm thick; cells at the surface textura angularis, 7-15 μm in greatest dimension, wall 0.5-1 μm thick. Asci clavate 60-80 x 10-18 μm, apex simple; ascospores biseriate. Ascospores fusiform to narrowly reniform, 19-22 x 4-4.5 μm, 1 - septate, not constricted, striate, hyaline when discharged.

Habitat: on rotting wood and on rachises of ferns.

Distribution: New Zealand, Panama.

NEW ZEALAND: Holotype of *Nectria arenuloides* (PDD). PANAMA: Prov. Panama, summit of Cerro Jefe, ca 23 Km N of Pan American Highway, ca 3.000 ft., on herbaceous stem, 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-62* (NY); Prov. Panama, summit of Cerro Jefe, on leaf, 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-88* (NY).

Illustrations: Samuels, New Zealand J. Bot. 14: 255, fig. 11; 257, fig. 23; 259, fig. 34, 1976.

Notes: Although this species bears a superficial resemblance to *N. ochroleuca,* it is more closely related to *N. arenula* (Berkeley & Broome) Berkeley (see Booth, 1959 for distinguishing features).

31. **Nectria calami** (P. Hennings & Nyman in Hennings) Rossman, Mycotaxon, **8:** 494. 1979.

= *Calonectria calami* P. Henn. & Nyman in Hennings, Monsunia, *1:* 163. 1900.

Conidial state: *Acremonium* sp.

Perithecia solitary or in groups of 2-3 seated directly on the substrate, pale luteous, orange to orange-brown, globose to tympaniform 300-350 μm in diam, nonpapillate, with a smooth wall, becoming cupulate when dry, not changing color in 3% KOH or 100% lactic acid. Perithecial wall 25-35 μm wide, differentiated into 3 regions; cells at the surface indistinct textura epidermoidea, wall 1-2 μm thick, copious yellow pigment in amorphous drops coming out from the wall cells of the midle region when perithecia are crushed in 100% lactic acid. Asci clavate to fusiform, 70-90 x 10-15 μm, apex simple; ascospores biseriate. Ascospores fusiform, 30-35 x 4-5 μm, 5-8-septate, not constricted, smooth to striate, hyaline when discharged.

Habitat: on bark and herbaceous debris.

Distribution: New Zealand, Panama, Peru.

PANAMA: Prov. Veraguas, lower slopes of Cerro Tuté, ca 8 Km NE of Sta. Fe, on property of Agricultural School Alto de Piedras, ca 2.000 ft., on rachis of fern, 19 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-648* (NY); Prov. San Blas, along trail in mountains just W of Puerto Obaldía, ca 400 ft., on petiole of leaf, 23 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter PA-1080* (NY); Prov. San Blas, along trail in mountains just W of Puerto Obaldía, ca 400 ft., on herbaceous stem, 23 Jun. 1975, *K. P. Dumont, S. E. & S. M. Carpenter PA-1139* (NY); Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 1.000-1.300 ft., on peduncle of palm fruit, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1270* (NY); Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 1.000-1.300 ft., on burned banana stalk, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1280* (NY). PERU: Depto. Junín, ca ½ hour drive from Satipo toward Calabaza, on the Satipo-Concepción Rd, ca 2.600 ft., on herbaceous stem, 28 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-166* (NY, USM).

Notes: *Nectria calami* superficially resembles *Nectria ochroleuca* and *N. arenuloides,* but the outlines of the perithecial wall cells of *N. calami* are indistinct, whereas the cells of the wall of both *N. ochroleuca* and *N. arenuloides* are clearly angular.

32. **Thyronectria pseudotrichia** (Schweinitz ex Berkeley & Curtis) Seeler, J. Arnold. Arbor., **21**: 438. 23 Oct. 1940.

= *Nectria pseudotrichia* Berk. & Curt., J. Acad. Nat. Sci. Philadelphia, *2:* 289. 1853.

= *Megalonectria pseudotrichia* (Berk. & Curt.) Spegazzini, An. Soc. Ci. Argent., *12:* 217. 1881.

= *Pleonectria megalospora* Spegazzini, An. Soc. Ci. Argent., *12:* 216. 1881.

= *Pleonectria riograndensis* Theissen, Broteria, Ser. Bot., *9:* 143. 1910.

Conidial state: *Stilbella cinnabarina* (Montagne) Wollenweber, Angew. Bot., *8:* 195. 1926.

Perithecia in cespitose groups of from 2-20, on a barely erumpent stroma, usually seated around a long red synnema which has a single, pink, slime head of unicellular conidia. Perithecia red, globose, 200-600 μm in diam, smooth or scaly, nonpapillate, cupulate when dry, red in 3% KOH, yellow in 100% lactic acid. Perithecial wall ca 35 μm thick, with an outer region of angular cells measuring 7-10 μm in greatest dimension, wall ca 2 μm thick; cells at the surface textura angularis, 7-10 μm in greatest dimension, wall 2 μm thick. Asci clavate 50-100 x 10-25 μm, apex simple; ascospores biseriate. Ascospores ovoidal 15-40 x 7-15 μm, muriform, smooth, hyaline to pale brown when discharged.

Habitat: on recently cut wood and bark.

Distribution: New Zealand, Jamaica, Panama, Colombia, Venezuela, pantropical.

COLOMBIA: Depto. Magdalena, Sierra Nevada de Sta. Marta, hacienda Cincinati, 1.250-1.500 m, 10 Aug. 1935, *G. W. Martin 3260* (NY). JAMAICA: Boundary between St. Andrew and Portland Parishes, along Lady's Mile trail to just S of Woodcutter's Gap, vicinity Newcastle, on Syzigium, 9 Jan. 1971, *R. P. Korg, J. R. Dixon, K. P. Dumont, R. W. Erb, D. H. Pfister, D. R. Reynolds, A. Y. Rossman & G. J. Samuels CUP-MJ 743* (CUP, IJ, NY). PANAMA: Prov. Panama, summit of Cerro Jefe, ca 23 Km N of Pan American Highway, ca 3.000 ft., on branch, 11 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-59* (NY); Prov. Cocle, base of Cerro Pilón, 5 Km NE of El Valle, ca 2.200 ft., on branch, 13 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-234* (NY); Prov. Cocle, eastern slopes of Cerro Caracoral, ca 3 Km NE of El Valle, on road to Mata Ahogada, ca 2.000 ft., on stump, 15 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-396* (NY); Prov. San Blas, trail from Pto. Obaldía to Darién, ca 300 ft., on branch, 22 Jun. 1975, *K. P.*

Dumont, S. E., S. M. Carpenter & S. A. Mori PA-939 (NY); Prov. San Blas, from Puerto Obaldía along trail to Darién and the foothills of the Cordillera, ca 5 hours walk, WNW of Puerto Obaldía, ca 600 ft., on log, 23 Jun. 1975, *K. P. Dumont & S. A. Mori PA-1165* (NY); Prov. Panama, 10-12 Km N of Pan American Highway, on El Llano-Cartí Rd, ca 1.000-1.300 ft., on herbaceous stem, 28 Jun. 1975, *K. P. Dumont, S. E., S. M. Carpenter & S. A. Mori PA-1283* (NY); Prov. Panama, vicinity Altos de Pácora, 26-31 Km N of Pan American Highway, on old road to Mandinga, ca 2.100-2.200 ft., on log, 30 Jun. 1975, *K. P. Dumont, S. E. Carpenter & S. A. Mori PA-1611* (NY). PERU: Depto. Junín, ca ½ hour drive from Satipo toward Calabaza, on the Satipo-Concepción Rd, ca 2.600 ft., on branch, 28 Jun. 1976, *K. P. Dumont, S. E. Carpenter, M. A. Sherwood & P. Buriticá PE-180* (NY, USM). VENEZUELA: Edo. Miranda, vicinity Quebrada Los Palos Grandes, south facing slopes of La Silla, Parque Nacional El Avila, on bark, 2 Jul. 1972, *K. P. Dumont, G. J. Samuels & B. Manara VE-3658* (NY); Edo. Miranda, vicinity refugio "No te apures", south facing slope of La Silla, Parque Nacional El Avila, on bark, 30 Jun. 1972, *K. P. Dumont, G. J. Samuels & B. Manara VEN-3879* (NY); Edo. Sucre, ca ½ hour walk along trail N of Manacal, NW of Irapa, on bark, 9 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & J. Farfán VE-4531* (NY, VEN); Edo. Sucre, trail between Manacal and Los Pocitos, NW of Irapa, on wood, 10 Jul. 1972, *K. P. Dumont, R. F. Cain, G. J. Samuels, G. Morillo & J. Farfán VE-4632* (NY).

Illustrations: Seeler, J. Arnold. Arbor. 21: pl. 1, figs. 5, A-E; pl. 3, figs. A-C; pl. 4, fig. 6; pl. 5, fig. 5, 1940.

Notes: *Thyronectria pseudotrichia* is one of the most common and distinctive species of tropical hypocrealean fungi. It is found only on recently cut wood. Often synnemata are so numerous that the substrate appears hirsute. Seeler (1940) redescribed the species and listed many synonymus.

ACKNOWLEDGEMENTS

This work was completed at The New York Botanical Garden. Clark T. Rogerson allowed us unlimited access to notes and specimens in his keeping and Dr. Amy Y. Rossman offered many helpful suggestions. The junior author wishes to acknowledge the National Science Fundation grants GB 28593 ff which supported his field work.

Special thanks is given to our many Latin American cooperators who have assisted us in providing working space in their institutions and in making logistical arrangements in their respective countries. Without their assistance

our field work could not have progressed as it did. Colombia: Drs. A. Fernández, E. Forero and P. Pinto (COL); Venezuela: Dr. T. Lasser (VEN); Ecuador: Dr. J. Vega, of Quito, and Peru: Dr. R. Ferreyra (USM). The Missouri Botanical Garden provided a base for our operations in Panama.

Dr. Pablo Buriticá (ICA, Colombia) accompanied us on our trips to Ecuador, Peru and on many in Colombia. His companionship and assistance in day-to-day logistical arrangements are warmly acknowledge.

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